

THE IMPACT OF  
SELECTED INSTITUTIONAL CHARACTERISTICS  
ON TUITION PRICING STRATEGIES

By

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The objective of this study was to identify the dominant tuition pricing strategy utilized in private comprehensive colleges and universities and to identify those institutional variables which may influence the tuition pricing strategy followed.

The study methodology involved the distribution of a survey questionnaire to 160 chief business officers of private comprehensive colleges and universities located within the continental United States. Completed surveys were returned by 115 (71.8%) respondents with 4 responses deleted for reasons of inaccurate or inconsistent data. Responses from the remaining 111 chief business officers were used as the basis for this study. The primary purpose of the survey was to determine the dominant pricing strategy followed, the secondary pricing strategy used, to gather data on enrollment changes, level of



tuition and to identify the most important factors used in the tuition pricing decision.

Quantitative institutional data were secured from the National Center for Higher Education Management Systems (NCHEMS) and merged with the survey responses provided by the chief business officers. These data consisting of 31 institutional variables were classified into six major categories defined for purposes of this study as endowment, revenue, enrollment, faculty, expenditure, and external factors. The general null hypothesis stated that there were no differences ( $p < .10$ ) among the institutions when they were grouped by institutional pricing strategy on any of the 31 selected institutional variables for the four major pricing strategies identified.

Of the 111 institutions from which survey responses were received, 47 (42.4%) followed the residual pricing policy, and 37 (33.3%) followed the peer pricing strategy. Proportional and externally indexed pricing had 13 (11.7%) and 11 (9.9%) responses respectively. The smallest category was differential pricing with only 3 (2.7%) institutional business officials identifying this strategy. During the 5-year period of 1980 to 1985, 91 (82%) of the respondents indicated the same pricing strategy was used.

As a result of the study, it was concluded that 6 variables out of 31 were different among institutions when they were grouped by institutional pricing strategy. The most significant variables were

related to endowment income as a percent of total education and general revenues, endowment income per full-time equivalent student, and the level of endowment per full-time equivalent student.

Also significant were the variables of the percentage change in tuition for the period of 1972-73 to 1980-81, the 5-year change in undergraduate enrollment, and private enrollment in the region in which the institution was located (regional market share).

## CHAPTER ONE BACKGROUND OF THE STUDY

### Introduction

Pricing of a product in the marketplace involves the interaction of six factors: supply, demand, price of related products, degree of competition, quality of the commodity, and the ability of the consumer to purchase the commodity. In the discipline of economics these factors are treated within microeconomics as price theory.

In a purely economic sense the consumers (students) will pay a price (tuition) for a product (education, degree, etc.). According to the National Center for Education Statistics (1984) tuition accounted for 50-75% of the total institutional budget. In private higher education tuition represents the most significant income item in support of the institution.

The tuition price established by a college or university policy body is complicated by a variety of factors such as the costs of providing the services, mix of other income, perceived quality of the institution, geographic location, market share, and competition from other institutions. (Cohen, 1982)

Funk (1972) found that the price sensitivity of students has become more apparent in recent years and that students now consider

price in their selection process for university attendance. Jackson and Weathersby (1975) concluded from their review of empirical studies that there was a negative relationship between tuition price at a specific institution and the probability that a potential student would attend. Nerlove (1972) found that tuition pricing was complicated by state, federal, and institutional financial aid; tuition price discounting through institutional merit or need-based aid; and the growing spread of tuition price between private and public universities.

In a recent review of pricing policies, Shaman and Zemsky (1984) categorized pricing into six major segments: proportional cost pricing, which sets tuition equal to some fixed proportion of the cost of education; externally indexed pricing, which links tuition to an index such as the Consumer Price Index; peer pricing, which sets tuition in accordance with the competitive (peer) institutions; value added pricing, which ties tuition to future benefits such as higher lifetime earnings; residual pricing, which establishes tuition as the amount required to balance the budget; and mandated pricing, which is set by legislative act or public policy.

In a marketplace of shrinking enrollments, the Western Interstate Commission for Higher Education (1984) estimated a significant decline in high school graduates by 1992. They estimated a decline of 600,000 students from a high of 2.9 million in 1982. Given these projections, pricing will become much more critical, especially for private comprehensive colleges and universities with tuition revenues as the major revenue source. The problem for

university administrators will be how to set tuition so that the institution can maintain its market share and provide continued educational quality. (Eckstein, 1960)

In a study of public higher education price setting, Rusk and Leslie (1978) examined 50 public institutions, one from each state. Their results showed that the prices charged were affected by the market area of the institution, the market share held by competitors, the costs of public subsidies, the per capita income within the state, and the quality of the institution.

These results, however, are inconclusive. The arena of the private institution is different from the public because of significant variations in the level of tuition paid by the student. As tuition rises, the student consumer will evaluate his or her choices more critically.

A review of the literature surrounding this pricing issue reveals little information on the pricing strategies followed in private comprehensive colleges and universities. The popular press is replete each year with stories on the rising costs of private higher education, and administrators explain increases in terms of maintaining competitive faculty salaries, maintenance of quality, and physical plant needs.

#### Purpose and Null Hypothesis

The purpose of this study was to identify the dominant tuition pricing strategy utilized in private comprehensive colleges

and universities and to identify those institutional variables which may influence the tuition pricing strategy followed. As defined earlier, these pricing strategies were proportional cost pricing, externally indexed pricing, peer pricing, value-added or differential pricing, residual pricing, and mandated pricing. For purposes of this study, mandated pricing was deleted because the population investigated was private comprehensive colleges and universities not subject to state financial regulation or allocation of funds.

The 31 institutional variables were broadly grouped into 6 categories consisting of endowment, revenue, enrollment, faculty, expenditure, and external factors. These categories were identified through the literature review as important factors considered by policymakers in the establishment of tuition.

To state the problem another way: Are these institutional variables different among reported institutional pricing strategies? The investigation of this question was facilitated by the testing of the following general null hypothesis: There are no differences ( $p < .10$ ) among the institutions when they are grouped by institutional pricing strategy on any of the 31 selected institutional variables.

#### Delimitations and Limitations of the Study

The study was limited to private comprehensive colleges and universities because of their dependence on tuition as the major revenue source. These institutions were classified as comprehensive

colleges and universities using the National Center for Higher Education Management Systems (NCHEMS) taxonomy developed by Mankowski (1979). This taxonomy defines a comprehensive college or university as one offering diverse post-baccalaureate programs, including first professional, but not engaging in significant doctoral education.

The primary limitation of the study was the instrumentation used to gather data. The survey instrument, designed to identify the pricing strategy followed, was subject to the individual interpretation of the chief business officer. To overcome this inherent problem, a precise definition was provided for each strategy and the respondent was asked to identify the pricing strategy followed by the institution.

The study was confined to those 160 institutions classified as private comprehensive colleges and universities. The most recent data reported for 1983-84 for the 31 institutional variables were obtained from the National Center for Higher Education Management Systems (1987). In cases of obvious data inconsistency or inaccuracy, the institution was deleted or the data corrected from independent sources. Responses from 4 institutions were deleted for the reasons stated above, leaving a study population of 111 institutions.

### Definition of Terms

The following terms were used in this study:

Private comprehensive colleges and universities are those institutions characterized by diverse post-baccalaureate programs, including first professional, but not engaging in significant doctoral education. (Mankowski, 1979)

Education and general expenditures (E&G) are expenditures made in direct support of instruction, research, public service, student services, institutional support, and plant operations.

Endowment funds are funds with respect to which donors or other outside agencies have stipulated, as a condition of the gift instrument, that the principal is to be maintained inviolate and in perpetuity and invested for the purpose of producing present and future income which may either be expended or added to principal (AICPA, 1975).

Full-time equivalent student (FTE) is a student equivalency factor derived by dividing student credit hours by an average course load of 15-semester hours for undergraduates.

Institutional financial aid is financial aid funds provided students from institutional education and general funds.

Instructional costs are those costs reported in audited financial statements as the direct costs of instruction.

Regional market share, expressed as a percent, is computed by dividing the number of students enrolled in private colleges and universities by the total number of students, both public and private, within the region. The composition of each region was defined by the Digest of Education Statistics (1987).



Median family income is a statistical measure which represents the midpoint of family income levels for each state as reported by the United States Census Bureau (1980).

Tuition and fees include all tuition and fees assessed, net of refunds, against students for education and general purposes.

Weighted average faculty salaries are salaries reported by academic rank and weighted by the number of faculty within each rank.

### Significance of the Study

As the costs borne by students become more significant, it is important to assess the impact of various institutional variables as determinants in setting tuition and selecting a tuition pricing strategy. According to Harris (1970), MacKay-Smith (1985), and Ross (1985) pricing increases are justified publicly in the context of increasing costs, maintaining excellence, quality improvements, and other rationales acceptable to the consumer public. The evaluation of institutional variables implies that these factors do not change significantly over a reasonable period of time; therefore institutional priorities are reflected in these quantifiable measurements.

It was believed that the results of this study would advance knowledge in the field by expanding research done in the public sector by Rusk and Leslie (1978) and McKeown (1982) and identify those institutional variables that may influence the setting of tuition pricing in private comprehensive colleges and universities. In

addition, the results of this study could lead to the development of a modified basis for determining tuition charges in private comprehensive colleges and universities.

### Overview of Methodology

A survey instrument was developed by the researcher and was completed by the chief business officer identified at each institution. The survey instrument was used to ascertain which pricing strategy was followed through the forced selection of one of 5 different alternatives. In addition, each participant was asked to identify other factors considered in strategies setting the tuition price, to report on enrollment trends, to assess the impact of rising tuition upon enrollment, and to report the acceptance rate of new admissions. The survey instrument is shown in Appendix 2.

The institutions identified as private comprehensive colleges and universities were classified according to Mankowski (1979) and the institutional data for the 31 variables analyzed were obtained from the Higher Education General Information Survey (HEGIS) of the National Center for Education Statistics (NCES) for the 1983-84 fiscal year.

For each college or university in the population used for this study, the following variables were extracted from the 1983-84 HEGIS report:

Endowment-related variables included endowment income as a percent of total education and general revenue, endowment income per

full-time equivalent student, endowment per full-time equivalent student, market value of endowment June 30, 1981, and endowment fund balance as a percent of current fund expenditures.

Revenue-related variables included percentage change in tuition for the period of 1972-73 through 1980-81, total education and general revenues per full-time equivalent student, private gifts and grants per full-time equivalent student, tuition and fees as a percent of total education and general revenues, gifts and grants as a percent of total education and general revenues, tuition and fees per full-time equivalent student, and fall semester 1986 tuition as reported from the survey instrument.

Enrollment-related variables included total headcount enrollment, total full-time equivalent enrollment, and the ratio of full-time to total headcount enrollment for the 1983-84 fiscal year. The chief business officers reported on the survey instrument the change in undergraduate enrollment over a 5-year period and their assessment of the impact of tuition increases on enrollment.

Faculty-related variables included the number of tenured 9-month faculty, weighted average 9-month faculty salary, the number of 9-month faculty, and the percent of tenured 9-month faculty for the 1983-84 fiscal year.

Expenditure-related variables included total education and general expenses per full-time equivalent student, academic support expenditures per full-time equivalent student, instructional costs per full-time equivalent student, instruction as a percent of total education and general expenditures, institutional student aid as a

percent of total education and general expenditures, student aid per full-time equivalent student, and financial aid as a percent of tuition.

Other external factors considered were regional market share, 1979 median family income for each state and enrolled students as a percent of applications for each institution.

The method of analysis used in this study for interval scaled data was the one-way analysis of variance (ANOVA) procedure followed by the Duncan multiple range test. The null hypothesis was tested at the  $p < .10$  level. For nominal scaled data the chi-square test was used with the null hypothesis evaluated at the  $p < .10$  level. A full description of the methodology used in this study is shown in Chapter Three.

### Overview of the Study

In Chapter Two of this study the pertinent literature related to tuition pricing in higher education is reviewed. A description of the review of the literature regarding tuition pricing is included.

In Chapter Three is a description of the research methods employed. Topics such as survey development, sampling procedures, and statistical methods employed in analyzing the data are discussed.

Chapter Four contains the results of the study with reference to the summary statistics, data analysis, statistical methods, and testing of the general null hypothesis.

Chapter Five provides the summary and discussion from the completed research and recommendations for future research.

## CHAPTER TWO REVIEW OF RELATED LITERATURE

### Introduction

Presented in this chapter are the results of the literature review related to pricing of undergraduate tuition at private comprehensive colleges and universities. The results of this review are arranged in topical sections covering the scope of this study. The review includes a description of the concept of tuition and related definitions; a comparison of public and private universities with regard to various selected characteristics; a review of the economics of price; the pricing policy issues of product quality, pricing objectives, and educational costs; and the descriptions of pricing strategies identified in the literature review. Concluding this chapter are summary and observations drawn from the review.

### Tuition

Tuition is the price charged by officials of a college or university to the student for attendance at the institution. This price may or may not cover the actual cost of instruction, but in all cases, this source of revenue represents a significant portion of

current income. Hopkins and Massy (1981) found that in institutions where tuition is the dominant source of revenue, the setting of tuition was one of the most important financial and economic decisions undertaken during the annual budget cycle.

In a survey of 20 institutions, Saupe and Blagg (1977) reported little consistency in the terminology used for tuition and fees. They indicated fee structures varied considerably, and little, if any, information existed on the design or rationale used to change or modify fees. Dejnozka and Kapel (1982) defined tuition as

financial charges assessed students by an educational institution (e.g. college, university, private elementary or secondary school) to pay for instruction. There is no universally established procedure used by all educational institutions to determine tuition costs. Some institutions charge tuition on the basis of each credit hour or course for which the student is registered. Others impose uniform charges for the semester or year. Tuition for undergraduates is frequently different (lower) than that charged graduate students. Fees charged for a particular purpose (e.g. laboratory fees) supplement rather than being a part of tuition.

Tuition in private institutions is usually higher than in public institutions, primarily because public (tax) monies are used to support part (in some cases, most) of the costs of instruction in public schools and colleges. Tuition costs may change from year to year, depending on such factors as nontuition support received by educational institutions, changes in the cost of living, and so on. In almost all instances, tuition received from students defrays but a part of the total instructional costs of an education. (p. 532)

Tuition represents the major source of revenue for the 160 private comprehensive colleges and universities in this study. Table 1 shows that during 1985-86, the National Center for Education Statistics (1986) reported that in private comprehensive colleges and universities

tuition was 58.3% of current income. This compared with 19.3% for similar public comprehensive colleges and universities.

Further analysis of Table 1 showed the distinction between private and public comprehensive colleges and universities with regard to other revenue sources. Private comprehensive colleges and universities received only 2.1% of revenues from federal, state, and local appropriations as compared to 53.1% for their public counterparts. As one might expect, this was the largest revenue source for public universities in this category.

Both types of institutions received about the same percentage of revenue from grants and contracts, and auxiliary operations. This would indicate that this activity was very similar for both types of institutions.

The major difference in private support for institutions was evident in the comparison of private gifts and endowment income. Private comprehensive colleges and universities significantly exceeded their public counterparts in both private gifts (7.0% versus 1.7%) and endowment income (5.1% versus 0.2%). Based upon the increased contribution of both private gifts and endowment income to private comprehensive colleges and universities, it was determined that these variables should be identified as factors for consideration.

Private university leaders have found it increasingly difficult to remain competitive in terms of tuition pricing. Brinkman (1982), who analyzed a sample of 2,488 institutions over a 7-year period of 1972-73 to 1979-80, reached the following conclusions:

While the rate of tuition increase among private institutions was greater than among public

Table 1

Comparison of Current Income--Private and Public Comprehensive  
Colleges and Universities, 1983-84

Revenue Source:	Percent of Total Current Income	
	Public	Private
Tuition and Fees	19.3%	58.5%
Appropriations: Federal, State, & Local	53.1	2.1
Grants & Contracts, Federal, State, & Local	6.4	5.8
Private Gifts, Grants & Contracts	1.7	7.0
Endowment Income	0.2	5.1
Auxiliary Operations and Sales & Service	<u>19.3</u>	<u>21.5</u>
TOTAL	100.0%	100.0%

Note: The number of institutions in each category was not reported.

Source: National Center for Education Statistics (1986)



institutions, it was not out of step with price movements in other areas of the economy. . . the rate of tuition price increase in private institutions has been generally consistent with the movement of the consumer price index. (p. 9)

Other researchers have confirmed this trend since 1979-80.

Suttle (1983) explored in detail the rising costs of private education in the context of a high-priced private institution. From his analysis of Yale University, he concluded that the real cost of tuition grew at an amount less than 1% over a 10-year period ending in 1982 after adjusting for inflation in the general economy.

In an analysis of tuition trends and the tuition gap between private and public universities, McPherson (1978) reached two important conclusions. First, the ratio of private to public tuition over the period of 1929 to 1974 increased only slightly from 3.6 to 4.2. Second, the dollar difference in tuition as a fraction of disposable personal income, adjusted for inflation, remained relatively constant.

Suttle also concluded, based upon a 25-year analysis of tuition from 1950-51 to 1975-76, that the percent of median family income spent on tuition and total student charges had remained remarkably constant in a range of 31% to 35%.

In a comprehensive study of tuition and the costs of higher education, Nerlove (1972) advocated that tuition should be a price in the economic sense. That is, the price of tuition should allocate or ration the supply of, and the demand for, the product called higher education.

The tuition and fees charged by public institutions are quite consciously set below any plausible estimate

of what it costs to educate a student; the same is true of high quality liberal arts colleges as it is for the major private and public universities. (p. 180)

Nerlove concluded that "subsidies provided public universities, through direct support, produced tuition below cost and have depressed the level of tuition in private institutions" (p. 211). This differential in tuition between public and private institutions created "the effect of virtually strangling the private part, which is caught between rising costs and its own inability to raise the prices it charges for its product" (p. 212).

Based upon these studies it was decided to gather quantitative data on the following variables: total education and general revenues, private gifts and grants, and tuition and fees per full-time equivalent student; tuition and fees as a percent of total education and general revenues; private gifts and grants as a percent of total education and general revenues and tuition reported for the 1986-87 academic year by institution.

The conclusions drawn from these researchers depend upon the assumptions used in setting tuition. The continuum runs from the pure economic price allocating scarce resources to the adoption of a pricing policy which takes into consideration the special needs of the higher education marketplace. Gilmore and Suttle (1984) provided an excellent summary of the many dimensions of the tuition pricing decision in private universities. A discussion of these alternatives follows.

### Pricing Policy Issues

When addressing the issue of pricing policy, the approach must be from the aggregate to the specific. In the arena of higher education there are two major sectors: public colleges and universities supported by state and local governments, and private colleges and universities supported by tuition and private philanthropy.

The National Commission on the Financing of Postsecondary Education (1973) developed a series of recommendations for student access through institutional accountability. Many of these concepts were addressed specifically to the pricing of higher education. From a comprehensive report (over 400 pages), Lawrence (1974) prepared a summary highlighting the conclusions and recommendations of the Commission. With regard to tuition price and private colleges and universities Lawrence noted reasonable choice should be provided "among those institutions regardless of tuition charged or family income" (p. 2). He went on to say there must be institutional diversity "if all reasonable needs of students and society are to be met. A number of finance related trends. . . threaten diversity" (p. 3). Strong evidence suggests a relationship between "financing and excellence in postsecondary education" (p. 4).

Lawrence stated, "the relative availability or scarcity of financial resources, regardless of number of sources, is probably the most significant factor affecting institutional independence. . . and

funders may want to know how much institutions spend [including cost per student] to achieve an objective and to what extent the objective is achieved" (p. 5).

He concluded that "adequate financial resources should be provided from state and local governments. . . federal government. . . students and their families. . . to the extent of their [financial] ability. . . and from alumni, foundations, and corporations to ensure high quality among both private and public institutions" (p. 6).

Breneman and Finn (1978) found that private institutions were at a competitive disadvantage when compared on any measure related to tuition pricing. Government, at the federal and state level, removes part of this disadvantage through direct support to the institution or the student. States and regional associations have adopted policies with regard to tuition and fees. Zumeta and Green (1987) studied the impact of state policies regarding access and choice. They concluded that many states provided subsidies on a per student basis for attendance at private colleges and universities.

McKeown (1982) found that policymakers in 22 states had established criteria for charging tuition at public institutions within their states. In all cases, there was a differential for residency and, in many states, a differential based upon student level. McKeown also observed that there was a trend, given traditional age enrollment declines, to fit tuition pricing policies to the realities of the marketplace. Lawrence (1974) concluded that private universities have always considered the marketplace when setting tuition.

In 1973, Mayhew summarized the Carnegie Commission report which contained specific recommendations with regard to tuition pricing having a significant impact on the private sector. The commission recommended a gradual rise of public tuition levels to about one-third of the education cost. This would have the effect of narrowing the tuition gap and making private colleges and universities more affordable and price competitive with their public counterparts.

The commission also recommended narrowing the tuition differential between public and private institutions by increasing public tuition, supporting private colleges and universities through institutional aid, and providing state student aid programs. This would bring parity to the current differentials existing in tuition between the two sectors of higher education.

Moore (1978) analyzed data for the state of New York, where many of the Carnegie recommendations had been adopted. He concluded that by providing state institutional aid, student financial aid, and public tuition increases, many, but not all, of the financial barriers for attendance at a private college or university were removed. These strategies were implemented by the state over a 4-year period from 1973 to 1977 and kept the private/public tuition ratio about constant, but decreased the private/public enrollment ratio. This would imply that financial access to the private sector in New York state improved during this time period.

Halstead (1986) found that increased state aid in any form would directly or indirectly make private tuition levels more competitive with their public counterparts. In another study by Hearn

and Longanecker (1985), the enrollment effects of alternative postsecondary pricing policies were explored. As they relate to private higher education, the results confirmed earlier conclusions. The authors identified two major schools of thought, somewhat divergent, dealing with distributing public subsidies to the public sector of American higher education.

The traditional approach results in the broad distribution of public subsidies by maintaining low tuition. This approach tends to subsidize all students, regardless of financial need. The rationale for this approach is "the general belief that the returns to society from a highly educated citizenry justify significant public expenditures on education" (Hearn & Longanecker 1985, p. 459).

The targeted approach combines higher tuition and "more generous financial aid aimed squarely at those with financial need" (p. 459). This approach rests on two premises. Individuals and society both benefit from education so both should pay for its cost and "public expenditures for education should be provided so as to maximize the difference between public returns and costs" (p. 459).

This would imply that leaders of private colleges and universities, facing competition in the marketplace and faced with substantial tuition differentials, would favor the targeted approach. Concerns about raising tuition inducing enrollment declines have not materialized. In fact, Hearn and Longanecker (1985) stated that on the basis of existing research, there is strong evidence that responsible movement toward targeted subsidization of postsecondary education should not appreciably affect enrollment rates in the long run. (p. 476) They

concluded that "likewise some students attending public institutions might choose to attend higher cost private institutions because of decreased tuition differentials" (p. 476).

Krakower and Zammuto (1983) identified five environmental and five institutional factors impacting enrollment in colleges and universities. They concluded that there were three variables that had an institutional impact on enrollment in private colleges and universities. First, the previous year's enrollment was positively associated with the current year. Second, federal student financial aid was positively associated with enrollment. Third, tuition and fees were negatively associated with enrollment.

It is clear that state and federal policies have a major impact on tuition pricing in the private sector. According to Moore (1978) when certain state policymakers adopted higher tuition and enhanced financial aid, the private component became more competitive on a price basis. Outside of these external factors the leaders of private institutions must address their position within the private sector and with their peer competition. In a study by Hoenack and Weiler (1975) the relationship of cost-related tuition policies was explored in the context of university enrollments. They concluded that there was not enough empirical evidence to suggest that enrollments were impacted by alternative tuition policies.

Based upon these prior studies, it was decided for purposes of this study, to gather data on headcount enrollment, full-time equivalent enrollment, the ratio to full-time enrollment, the change in undergraduate enrollment over the preceding 5-year period, and an

assessment of the impact of increasing tuition on enrollment over the same time period. These variables were categorized as enrollment related.

### The Pricing Decision

Economists deal with price on a purely theoretical basis whereby price is the equilibrium between supply and demand. Kaysen (1960) stated that

a well functioning price system operating under ideal circumstances leads to the happy result that each kind of goods and service is produced and consumed in such quantity that. . . at the margin, what it is worth to the consumers who pay for it is just equal to what it costs the producers who supply it, and in turn, just what it costs society, in terms of foregone alternative uses of productive resources. (p. 55)

Because these economic ideals cannot be achieved unless a purely competitive environment exists, other price strategies are often followed. Mulvihill and Paranka (1967) summarized a comprehensive list of issues dealing with the pricing of products in the marketplace. Although not directly related to private comprehensive colleges and universities, the concepts are important to review. Five fundamentals were identified in addressing the pricing decision:

1. The consumer situation dealing with such issues as utility to the buyer, the perceived quality of the product, availability of substitute products, and relative or customary prices.
2. Cost considerations such as historical costs, costs of production, capacity, volume, and contribution to overhead.



3. The competitive and market structures in place. Included here are market position, share of market, leader or follower in the market, competitive response and actions, and the market position of substitutes.

4. The market structure and promotional policies which include geographic area, advertising strategy, promotional programs, and possibilities of more effective cooperation.

5. General economic considerations such as new product introductions, expanded geographic area, and adjustments to the cyclical nature of the economy.

Institutional leaders should consider these factors when adopting an effective pricing strategy. Kotler (1975) discussed four different pricing objectives which must be decided before a pricing strategy is adopted. The adoption of one of these objectives, or a combination, is important in developing a pricing strategy.

Business firms set their price to maximize their profits. The theory of profit-maximizing pricing is well worked out and widely understood requiring knowledge of the demand and cost functions for the product. Nonprofit organizations price according to other standards, such as covering costs, matching competition, subsidizing certain groups, and so on. (p. 70)

Kotler continued

Prices are not only an indicator of the rate of exchange but also communicators of a product's probable quality. If a list of tuitions charged by different colleges were shown to a group of people, they would probably take the tuitions to be an indicator of academic quality. (p. 71)

The pricing objectives proposed by Kotler were profit maximization, cost recovery, market incentivization, and market disincentivization. Each will be discussed briefly.

Profit maximization requires that leaders of an organization estimate a demand function for a range of prices and a cost function for a range of production to include fixed and variable costs. Total profit would equal the difference between total revenues and total costs. Difficulties of this approach include a tendency to maximize short-run profits and problems associated with estimating the appropriate demand and cost functions.

Cost recovery exists when revenues just cover costs or prices are set to cover a portion of the cost. In many institutions, including universities, the only objective is to cover operating costs and, in practice, "prices charged by their organizations are largely determined by tradition, public opinion, and actual or potential competition rather than any scientific standard" (Kotler, 1975 p. 181).

The objective of market incentivization is to attract adoption of a new service or program or to increase market share. Generally, this is done through the mechanism of establishing a low price to attract new customers. Market conditions of price sensitivity, decreasing unit production costs, and strong competition would lend themselves to the adoption of this objective.

Price setting with the objective of discouraging consumption would be used under market disincentivization. This objective is commonly used by governments to discourage consumption of tobacco products and alcohol. Optimally, prices would be set at a level high enough to achieve the objective desired.

In a quantitative analysis of the college choice process, Chapman (1979) developed a statistical model in which he identified two

important factors. He stated that "of the marketing decision variables at the control of a school, pricing policy seems to present both the greatest problems and the greatest opportunities" (p. 40).

Chapman went on to state that "of all the marketing decision variables, the pricing variable has a particularly significant role to play for private colleges and universities" (p. 42). Financial aid packaging to the student by the university allows the institution to effectively discriminate tuition price.

The conclusions drawn from this study indicated that college or university quality was a very important factor in the selection process. In addition, those students from higher income families tend to place an even stronger emphasis on quality.

The second major conclusion was that price "clearly has an important role to play in the college choice process" (p. 54) and for those students from lower income families, the kind and amount of student financial aid is the single most important factor.

Tierney (1982) confirmed the importance of price to the student as a factor in matriculation. In a study sample of 8,818 students admitted to at least one public and one private institution, he concluded that college quality and family income were two very important aspects in the college choice process. The "student assessment of an institution's value is predominately a function of the quality of the institutional alternatives and the relative net price of attending a particular institution" (p. 375).

In the area of consumer goods, the concept of price as a quality indicator has received considerable attention. Cornell (1978),

in a review of literature, suggested that "in a world where it is difficult for consumers to determine the attributes offered by competing products, price may come to function as a signal of quality" (p. 302). Although not directly related to private education, where prices are generally higher, price does signal quality. In a recent poll of college and university presidents (America's Best Colleges, 1985) many private colleges of perceived high quality were associated with the highest annual costs of tuition. Monroe and Petroschius (1981) found through their research that consumers associate higher prices with higher levels of quality. Murphy (1984) observed that "in higher education, this means that higher-status institutions can and should charge higher tuition" (p. 84).

#### Pricing Strategies Identified

In developing the survey instrument to gather information on pricing strategies, it was necessary to determine the extent of available alternatives. This led to the development of precise definitions for tuition pricing strategies. From this review, the top five pricing strategies, most appropriate for private comprehensive colleges and universities, were used in the development of the survey instrument.

Both private and public college and university policymakers generally review tuition on an annual basis. In a study of setting tuition at public universities, VanAlstyne (1977) identified five

major factors that needed to be considered in reaching the pricing decision. These were the overall demand for education, tuition levels at competing institutions, net revenues available to cover costs, cash flow requirements, and the explicit student aid policy in place. He went on to determine that "tuitions at public institutions are frequently determined not on the basis of explicit state education policy but as a residual calculation from the difference between budget requirements and state appropriations" (p. 66). Two pricing strategies were identified; residual pricing, in which tuition is set to balance the budget, and peer pricing, which compares tuition to tuition charged at competitive institutions.

Rusk and Leslie (1978) analyzed tuition pricing strategies at major public universities by selecting one university from each state. They examined five variables for their possible impact on tuition prices at these selected institutions.

The first variable examined was the price charged by competitors in the market area. This reflects the concept of peer pricing. They concluded that this variable "clearly suggested. . . those responsible for establishing tuition are aware of tuition. . . levels in adjoining states. Further, tuitions. . . bear a strong resemblance to tuitions at other in-state institutions, both public and private" (p. 534).

The second variable was market share defined as the proportion of enrollment of private and public universities in the state. Rusk and Leslie concluded that in states where there were high enrollments in private colleges and universities, relative to public colleges and

universities, tuition charges were significantly higher than the average.

The third variable examined was college and university costs, net of any public subsidies. The major cost identified was faculty salaries. One might expect those institutions with high faculty salaries would have the highest tuition but this was not the case due to the many different techniques of funding state-supported higher education. In those states with the highest support for public higher education there were generally lower tuition levels.

The fourth variable was the relationship between per capita state income and tuition charged. Two interesting trends emerged here. First, in states with higher than average per capita income students were charged higher than average tuition and, second, in states with high student aid programs there were higher tuition levels.

The last variable examined was institutional quality. Rusk and Leslie (1978) utilized a numerical rating system based upon the Gourman Report, assigning a quality index to each institution. Higher tuition was expected to be positively correlated to quality but the results were inconclusive.

Rusk and Leslie (1978) identified two more pricing strategies used by state universities. These were proportional pricing, which sets tuition to cover a certain percentage of total current funds revenues, and setting tuition to cover instructional costs. Although their study dealt entirely with public universities, the results and conclusions were important to this study of private universities. These findings were consistent with those identified by Lamoureux

(1976) in an earlier study of pricing strategies used in marketing continuing education in which the concept of marginal pricing was discussed.

In a later study by Johnson (1979), an analysis was made of differential tuition levels and instructional costs. He examined institutions in six states that established tuition as a percentage of instructional costs. The conclusions were interesting in that there appeared to be no basis for setting tuition as a function of costs. He concluded that in these states policymakers based tuition on comparable levels in nearby states (peer pricing), high enough to satisfy revenue requirements (residual pricing), and in line with historical costs borne by the students (proportional pricing).

In the development of a planning model for Stanford University, Hopkins and Massy (1981) identified tuition as the major revenue source. In institutionally determining parameters for future projections, they were very concerned with Stanford's tuition vis a vis its competitors (peer pricing). In addition, projections for future tuition increases were made at 4% above the consumer price index (externally indexed pricing). They also recommended that certain programs charge higher tuitions than others thereby introducing the concept of differential pricing. This implies that institutional leaders may consider more than one pricing strategy in determining new tuition levels.

Ihlanfeldt (1981) concluded after a study of pricing policies in private higher education that "in the independent sector, pricing appears to be more of a residual policy matter than one related to

market forces. . . that is, historically, increases in tuition have been determined after revenues from other sources have been forecasted in relation to expected operating cost" (p. 100).

Other considerations by management in setting tuition price include the potential enrollment decline associated with higher tuition, the spread between public and private tuition, the "desired amount of revenue necessary to balance the budget" (p. 115), and stability of revenues over the long run. Ihlanfeldt also suggested that differential pricing be considered in those programs where costs are significantly higher or economic returns to the graduates are clearly enhanced.

In another study of state higher education executive officers Viehland, Kaufman, and Krauth (1982) examined the emerging trend in public higher education to index tuition levels to the cost of instruction. Both the Carnegie Commission on Higher Education (1973) and the Committee for Economic Development (1973) advocated increasing tuition to one-third and one-half of educational costs respectively.

Viehland et al. found "that 30 states do not have an established policy for determining tuition. . . tuition is determined in an ad hoc manner. . . best described as incremented pricing" (p. 335). In three other states policymakers had an established policy for setting tuition and had "written and formally approved statements of the factors to be considered in determining tuition levels, but no specific formula was used" (p. 335).

In 17 states tuition was indexed to a specific measure. In one state a peer institution review was used, and in another the Higher



Education Price Index was used. In all remaining states tuition was indexed to the cost of instruction or what was defined in the first chapter as proportional pricing strategy.

Viehland et al. indicated that the indexing of tuition had wide appeal because it introduced some degree of rationality into the process. Policymakers could "routinize the process, which appeals to decision makers at all levels" (p. 336). Also, by linking tuition to the costs of education, increases could be partially covered by student sources and tuition viewed as another income source to the state. Trends such as these in the public sector tend to influence pricing decisions in the private sector. The survey instrument developed for this study was used to determine the pricing strategy followed by private comprehensive colleges and universities.

The last major pricing strategy identified through the literature review was differential pricing in which tuition differed by program to reflect differences in instructional costs or differences in the perceived value of the program. Shaman and Zemsky (1984) identified this as value added pricing.

A more sophisticated approach to price setting in higher education was proposed by Troutt (1983) in which he used linear programming as a tool to assist university administrators in solving the tuition increase dilemma. The complexity of this method, and the lack of practical application for colleges and universities, precluded consideration of linear programming as a viable tuition pricing strategy for this study. This approach, however, certainly could be helpful in developing alternative scenarios for tuition pricing with the objective of maximizing revenues.

Yanikoski and Wilson (1984) cited three major reasons for traditional differences in pricing undergraduate education. First, "certain programs simply cost more for a university to operate and a portion of this higher cost should be passed on to students" (p. 738). Second, in certain disciplines future income potential justifies a higher investment cost on the part of the student. Third, higher tuition in certain high demand or over-enrolled programs may serve "as a signal of quality and selectivity" (p. 738).

Leaders of certain institutions may not want to consider differential pricing because they "will not have sufficient program diversity. . . [and] production costs of specific programs at these institutions typically are difficult to assess because faculty and facilities cross departmental boundaries so frequently" (p. 745).

#### Summary and Observations

The literature review suggested that the approach to the tuition pricing decision and the determination of the factors to be considered were complex activities. The purpose of this review was to identify pricing strategies and their application to private comprehensive colleges and universities. These results were used to design the survey instrument identifying pricing strategies in use and to ascertain if selected institutional variables would be different among these strategies.

Tuition pricing remains one of the most pressing concerns of the policymakers in higher education. With declining student demographics and generally lower inflation, innovative approaches must be adopted to achieve both institutional objectives and consumer satisfaction. In addition, institutional leaders will have to continually respond to changes in the structure of, and support for, student financial aid. Institutional quality will continue to be associated with price and those institutions with this reputation will be in a more favorable position to deal with tuition pricing decisions.

## CHAPTER THREE RESEARCH METHODOLOGY

### Introduction

Presented in this chapter is the research methodology employed by the researcher to gather data for the analysis of tuition pricing strategies followed by private comprehensive colleges and universities. Additionally, 31 institutional variables were identified which may have an impact on the tuition pricing strategy followed. There were three components to this process: First, a survey instrument was designed to gather institutional responses. Second, the quantitative institutional variables for the 1983-84 fiscal year were selected from the data base available from the National Center for Higher Education Management Systems (1987). Third, statistical techniques and data base management tools were employed to merge the two sources of data and analyze the information.

### Selection of the Population

After an extensive review of the literature, it was determined that those institutions which met the criteria of high dependency on tuition as the major revenue source were classified by Mankowski

(1979) as private comprehensive colleges and universities. This taxonomy was based on the classification of institutions developed by the Carnegie Foundation for the Advancement of Teaching (1976). During 1983-84, 160 institutions were classified in this grouping and it was determined that data would be gathered for the entire population. Over time this population is relatively constant with adjustments made for changes in the classification of institutions, new institutions, or institutional closures. Four institutions were deleted from the list due to their location outside of the continental United States. A complete listing of the 156 institutions that constituted the study population with the headcount enrollment for fall 1983 is displayed in Appendix 1.

### Instrumentation

The survey instrument was designed after a comprehensive review of the literature indicated that pricing strategies employed in private colleges and universities were not easily ascertained. Research suggested little consistent application of any one pricing technique.

The recommendations of Tull and Hawkins (1976) regarding an approach to survey design were followed in this study. They recommended that "questionnaire construction techniques focus on seven areas: (1) primary considerations, (2) question content, (3) question

wording, (4) response format, (5) question sequence, (6) physical characteristics of the questionnaire, and (7) pre-test" (pp. 241-242).

The initial survey instrument was designed with these seven considerations in mind and was reviewed by 15 business officers from institutions similar to those under investigation. These professionals were asked to review the instrument and make appropriate recommendations for changes to eliminate any possible ambiguous definitions. Based upon their suggestions, a revised instrument was developed with eight questions that would gather the required institutional information for determining pricing strategy and testing the general null hypothesis.

The most current list of private comprehensive colleges and universities was secured through the National Center for Higher Education Management Systems from the 1983 HEGIS report. The name and address of the chief business officer at each institution was obtained from the Directory of Higher Education (1985). For this study, the chief business officer was defined as the person having the responsibility for the financial and budgetary affairs of the institution.

A personalized cover letter was addressed to each chief business officer with an explanation of the research and the survey instrument. The survey instrument was individually addressed and printed to improve both the quality and appearance of the document. The surveys were mailed by first class mail with a stamped self-addressed envelope to facilitate response. The follow-up survey was printed on high quality blue bond paper to attract the attention

of the respondent. The survey instrument used in this study was specifically designed to determine pricing strategy currently followed and to gather additional information on enrollment, tuition charged, admissions efforts, and other price setting considerations. Participants in the survey response were assured institutional anonymity and were offered a summary of the final survey results.

The survey instrument (Appendix 2) contained eight specific questions which would provide the following information.

1. The dominant pricing strategy currently utilized by the institution. The respondent was asked to select only one pricing strategy from the definitions listed on the survey instrument.
2. The dominant strategy used 5 years prior. The respondent was asked to select only one pricing strategy from the definitions listed on the survey instrument.
3. The combination of pricing strategies utilized and other decision factors considered in making the pricing decision.
4. Increase or decrease in enrollment over the 5-year period 1982 through 1986.
5. An assessment of the impact of increasing tuition on enrollment by the chief business officer of the institution.
6. Identification of the five most important factors considered by the chief business officer in setting tuition. A standardized coding scheme was developed for this response and is shown in Appendix 3.
7. Tuition data for the fall term 1986 which would update information obtained from NCHEMS.

8. Percentage of enrolled students to the total number of applications. This was gathered to develop a measure of institutional selectivity which is associated with quality.

One hundred and sixty surveys were mailed to respondents and, after written follow-up, 115 surveys were returned. Telephone follow-up was carried out on 7 of the returned surveys to clarify responses. The relatively high response rate of 71.8% was attributed to interest in the topic and the researcher's offer to share the results. The responses to each question were entered into the data base for each university. Four institutional responses were deleted for reasons of inaccurate or inconsistent data.

The survey results were tabulated using the crosstabs subroutine available in the Statistical Package for the Social Sciences (Nie et al. 1981). The objective of this analysis was to determine the following information:

1. For the 111 institutions in the study, what was the primary pricing strategy in place at the time of the survey in 1986? For purposes of this study the differential and proportional pricing strategy were combined due to the small number of differential responses (3) and the inherent similarities of the two methods.

2. For the 111 institutions in the study, was the pricing strategy identified in question one different from the pricing strategy used 5 years prior?

3. Do the policymakers at the institutions in the study use more than one pricing strategy and, if so, what was the relative weight of each strategy in the determination of tuition?



4. Over the prior 5-year period did undergraduate enrollment at the institutions in the study, increase or decrease?

5. What was the impact of increasing tuition on enrollment in the opinion of the respondent? Data in this category was classified as negative impact or positive impact.

6. The chief business officers' responses to the most important factors considered in setting tuition were coded according to the classification in Appendix 3 and ranked from highest to lowest factor.

7. The 1986 tuition for each institution in the study was collected to check the reasonableness of the reported tuition data on the data tape obtained from the National Center for Higher Education Management Systems (1987).

8. The percentage of new enrolled students to total applications was used to determine a measure of institutional selectivity which has been widely attributed as a measure of institutional quality.

#### Source of Data

Each institution was identified by the Federal Interagency Committee on Education Code. This is a unique 5-digit code assigned by the United States Department of Education to specifically identify an institution for federal reporting in the Higher Education General Information Survey Report (1983).

A data tape was secured from the National Center for Higher Education Management Systems information services for all 160 private comprehensive colleges and universities in the group under study for the 1983-84 fiscal year. Information was extracted on data for endowment, revenue, enrollment, faculty, and expenditures. These data were reported for each institution through the Higher Education General Information Survey (1983). Data inconsistencies and obvious errors were corrected and four institutions were deleted from the study due to significant inconsistencies or inaccuracies. This resulted in a study population of 111 private comprehensive colleges and universities.

Data elements utilized for the purpose of this study were from institutionally reported information provided through the annual Higher Education General Information survey (1983). More specifically, the information in the beginning of the next section was extracted from the file for each institution. Based upon the review of the literature, these selected variables were anticipated to be important factors in the selection of a tuition pricing strategy.

Market share information for each institution in the study was obtained from the Digest of Education Statistics (1987) for the fall 1985 reporting period. Regional market share, expressed as a percent, was computed by dividing the number of students enrolled in private colleges and universities by the total number of students, both public and private, within the region.

The region of the country was identified according to the taxonomy developed by the United States Office of Education for use in the annual Higher Education General Information Survey. The regions of the country were grouped into two segments. Those regions having market share below 22.7% were defined as below average market share. Those regions having market share above 22.7% were defined as above average market share.

Data for median family income for 1979 was collected from the United States Census Bureau (1980). This data provided the researcher with median family income data for each state in which a private college or university was located.

#### Variables Analyzed

Information was gathered and classified under the following 31 variables for each of the 111 institutions comprising the study population:

##### Endowment-Related Variables

- Endowment income as percent of total E&G revenue
- Endowment income per FTE student
- Endowment per FTE student
- Market value of endowment, June 30, 1981
- Endowment fund balance as percent of current fund expenditures

##### Revenue-Related Variables

- Percent change in tuition 1972-1973 to 1980-1981
- Total E&G revenues per FTE student
- Private gifts & grants per FTE student
- Tuition & fees as percent of total E&G revenue
- Gifts & grants as percent of total E&G revenue
- Tuition & fees per FTE student
- Table of annual tuition costs

## Enrollment-Related Variables

- Total headcount enrollment
- Total FTE enrollment
- FTE as percent of total student enrollment
- Change in undergraduate enrollment
- Impact of tuition increase on enrollment  
reported from the survey instrument

## Faculty-Related Variables

- Tenured 9-month faculty
- Weighted average 9-month faculty salary
- Number of 9-month faculty
- Percent of 9-month faculty tenured

## Expenditure-Related Variables

- Total E&G expenses per FTE student
- Academic support per FTE student
- Instructional costs per FTE student
- Instruction as a percent of total E&G expense
- Instructional student aid as percent of total E&G expense
- Student aid per FTE student
- Financial aid as percent of tuition

## External Factors

- 1979 median family income for each state
- Enrolled students as percent of applicants
- Regional market share

This data file was merged with the data from the 115 institutions responding to the survey to create a unique data record for each institution in the study population. As noted, data from four institutions could not be utilized due to inaccuracies or the inability to match the Federal Interagency Committee on Education codes which identified each college or university. Calculations were performed on the remaining 111 institutions to determine pricing strategies and test the general null hypothesis.

### Statistical Methods Employed

Data analysis was facilitated using the University Computing Center at Xavier University in Cincinnati, Ohio. The Statistical Package for the Social Sciences (SPSS) release 9.0 version H (Nie et al. 1981) installed on an IBM 4341 Model 2 was utilized for the statistical analysis. This statistical package contains a system of subprograms which allows the researcher a variety of descriptive and analytical operations for data research. The program allows the user to manipulate the data to develop frequency tables, recalculation of data, and utilize a wide variety of statistical subroutines.

#### One-Way Analysis of Variance

The quantitative data for each institution were subjected to the statistical technique of one-way analysis of variance (ANOVA) to ascertain if these institutional variables were significantly different within the study population. This test was used on all of the variables listed in the prior section except the change in undergraduate enrollment, the impact of tuition increase on enrollment, and private enrollment in region (regional market share).

In this statistical procedure the relationship between a dependent variable (institutional variable identified) and one or more independent variables (pricing strategy) was explored. More specifically, for each dependent variable identified in the six major

categories, the sample means were assumed to be equal when they were grouped by the four possible pricing strategies. This was the general null hypothesis used for the purpose of this study.

For each independent variable there was a probability distribution. The means of each one of these distributions fall on the regression curve which described the relationship between the dependent and independent variables.

In this study, no assumptions were made with regard to the statistical relationship between dependent and independent variables. Neter and Wasserman (1974) stated that the "reason why analysis of variance exists as a distinct statistical methodology is that the structure of the independent indicator variables permits computational simplifications which are explicitly recognized in the statistical procedures for the analysis of variance" (p. 422).

This procedure allows the researcher to analyze a dependent variable in relationship to each independent variable. For purposes of this study, a single factor was identified and labeled as the pricing strategy. The averages, or means, of each variable were compared for each factor.

In analyzing the data, the following procedures were followed as outlined by Mason (1982). For each pricing strategy, the following general null hypothesis was stated: There are no differences ( $p < .10$ ) among the institutions when they are grouped by institutional pricing strategy on any of the 31 selected institutional variables. For example:

$$H_0 = u_1 = u_2 = u_3 = u_4$$

where  $u_1, u_2, \dots, u_j$  = the mean of the dependent variable under analysis and  $H_0$  is the null hypothesis.

If the null hypothesis is rejected, in other words, if there is a statistical difference, the  $H_1$ , alternative hypothesis, will be accepted.

The level of significance selected for the one-way ANOVA (F test) was  $<.10$  which represented the probability of rejecting the null hypothesis when, in fact, it was true. In this study, this would mean that there was less than a 10% chance that the conclusions drawn from the one-way analysis of variance was in error. The  $<.10$  level of significance was selected due to the nature of the population in the study and the large sample response rate.

The F test is based upon the development of the F ratio which is calculated for each variable as follows: (Mason, pp. 398-404)

$$F = \frac{\text{estimated population variance based on} \\ \text{variation among the sample means}}{\text{estimated population variable based on} \\ \text{variation within samples}}$$

where the numerator has  $K-1$  degrees of freedom and the denominator has  $N-K$  degrees of freedom where  $K$  equals number of pricing strategies and  $N$  equals the number of observations for a particular variable.

The SPSS program calculates the F ratio for each variable under consideration and compares this to the table value for the  $.10$  level of significance. It also computes the F probability, which corresponds to the F ratio, which is used to accept or reject the null hypothesis at the  $<.10$  level of significance.

Therefore, in the evaluation of each variable, if the calculated F probability was less than .10, the null hypothesis was rejected in that instance, leading to the conclusion that there were differences in the means of the variable under analysis that occurred other than by chance. If the F probability was greater than .10, it was assumed that, statistically, there were no differences in the means of the variable under analysis, and the null hypothesis was accepted in that instance.

#### Duncan Multiple Range Test

This test is a "systematic procedure for comparing all possible pairs of group means. The groups are divided into homogeneous subsets, where the difference in the means of any two groups in a subset is not significant at some prescribed level" (Nie et al. 1981 p. 427). For purposes of this study a significant level of .05 was used to evaluate the difference in the means of any two subsets.

This procedure described by Winer (1971) provides a basis for determining if there are differences in the means of the institutional variables when grouped by institutional pricing strategy, and if there are differences, what groups are different. The 28 interval scaled variables were subjected to the Duncan multiple range test to ascertain if any difference existed. This was done in conjunction with the one-way ANOVA procedure.



### Chi-Square Test

Data that were nominal scaled were analyzed using the chi-square test. The variables subjected to the chi-square test were the responses to survey question four, extent undergraduate enrollment changed; survey question five, impact of increasing tuition on undergraduate enrollment; and regional market share data used to classify institutions into below average market share or above average market share regions.

The purpose of the chi-square test according to Mason (1982) "is to determine how well an observed set of data fits an expected set" (p. 418). The null hypothesis states that "there will be no difference between the set of observed frequencies and the set of expected frequencies; that is, any difference can be attributed to sampling" (p. 418).

The general formula for the chi-square test is

$$\chi^2 = \frac{\sum (f_o - f_e)^2}{f_e}$$

where  $f_o$  is the observed value and  $f_e$  is the expected value.

The decision rule for accepting or rejecting the null hypothesis is formulated by referring to a chi-square table for the  $p=.10$  significance level with row minus one times column minus one degrees of freedom.

The general limitation of the chi-square test states "that for more than two cells, chi-square should not be applied if more than 20% of the  $f_e$  cells have frequencies less than five" (p. 423). This rule was adopted for the analysis of the data in this study.

If the calculated chi-square value is greater than the table value, the null hypothesis is rejected and the alternative hypothesis accepted. The chi-square statistic was derived for the three variables previously mentioned and the results are displayed in Chapter 4.

The survey results and statistical analysis of the data including the one-way ANOVA, Duncan test, and chi-square test are discussed in Chapter Four.

## CHAPTER FOUR ANALYSIS OF THE DATA

### Overview

The population of institutions used in this study were 160 private comprehensive universities as identified using the taxonomy developed by Mankowski (1979). Of the 115 college and university chief business officers responding to this survey, 4 of their institutions could not be utilized for data coding reasons. The remaining 111 institutions, therefore, were used as the basis for this research.

As described in Chapter Three, the survey data were merged with market share data, 1979 median family income data, and the National Center for Higher Education Management Systems (1987) data by institution to create a unique file record for each institution. These data were subjected to the following statistical analyses.

First, the institutional data were tabulated to identify the basic characteristics of the data such as frequency count by category, means, and distributions. This was helpful in determining if there were missing records, or incomplete data, for each institution.

Second, the interval scaled data which included endowment, revenue, enrollment, faculty, and expenditure-related variables were statistically analyzed using the one-way ANOVA technique, with a

follow-up procedure using the Duncan multiple range test. Included in this category were data for median family income and admission ratios for each institution.

Third, nominal scaled data collected from both the survey and other sources were analyzed by using the chi-square procedure. The data subjected to this analysis were the extent undergraduate enrollment changed over the last 5 years (survey question 4), the impact of tuition increases on undergraduate enrollment (survey question 5), and private enrollment in the region in which the institution was located (regional market share).

The variables under consideration were grouped in six major categories based upon the logical relationship of the underlying data. A summary of the variables and the assigned category was displayed in Chapter Three and appears in Appendix 4.

### Survey Results

The researcher, by the use of the survey instrument described in Appendix 2, submitted eight questions to the chief business officer of each institution. The purpose and design of the survey instrument was discussed in Chapter Three.

The first three questions of the survey instrument were designed to furnish the researcher with information on the pricing strategy followed by the chief business officers of private comprehensive colleges and universities. Table 2 provides a summary

of the responses. Of the 111 institutions from which responses were received, 47 (42.4%) followed the residual pricing policy, and 37 (33.3%) followed the peer pricing strategy. Proportional and externally indexed pricing had 13 (11.7%) and 11 (9.9%) responses respectively. The smallest category was differential pricing with only 3 (2.7%) institutional business officials identifying this strategy.

These results confirmed findings from the literature review which indicated that peer and residual pricing strategies were the two most dominant strategies, that proportional and external pricing were used to a lesser extent, and that differential pricing had only limited acceptance.

During the 5-year period of 1980 to 1985, 91 (82%) of the respondents indicated the same pricing strategy was used. Twenty respondents indicated that proportional (6), external (2), peer (6) and residual (6) had been used in the past. No institution identified differential pricing as a strategy for this 5-year period.

If secondary pricing strategies were used, each respondent was asked to distribute these strategies over the five categories totaling 100%. The results of this distribution are shown on Table 3. In response to question 3 of the survey instrument the chief business officers identified peer pricing as the most important secondary component in setting tuition, although their primary strategy identified was proportional, externally indexed, or residual.

In those institutions where proportional, externally indexed, or residual pricing was reported as the dominant strategy, peer pricing

was weighted 12.3% to 19.4% as an important component of setting tuition by the chief business officer. In institutions where peer pricing was identified as the dominant strategy, the policymakers weighted externally indexed pricing (13.8%) as a component in the tuition pricing decision. Three respondents indicated differential pricing as the dominant strategy and in those cases residual pricing (16.3%) was also used.

Although not displayed in the table, in most institutions the policymakers tended to use only two pricing strategies to develop the pricing decision. Use of a third strategy in no case exceeded 7.0% of the pricing decision for any dominant pricing strategy identified.

Question 4 on the survey instrument was intended to identify the increase or decrease in undergraduate enrollment during the prior 5-year period. Table 4 shows the observed data reported compared to the expected data. Respondents reported that in 57.8% of the institutions there was an increase in enrollment and in 42.2% of the institutions there was no increase in enrollment. Data were incomplete for two institutions. Only one expected value was less than five (4.4) which indicated the chi-square test could be used to test the null hypothesis.

Table 2

Dominant Pricing Strategy as Identified by the Respondents  
to Tuition Pricing Assessment Survey

Pricing Strategy Identified	Number of Respondents	Percentage of Respondents
Proportional	13	11.7
Externally Indexed	11	9.9
Peer	37	33.3
Differential	3	2.7
Residual	47	42.4
TOTAL	111	100.0

Table 3

Dominant and Secondary Pricing Strategy  
Identified by Tuition Pricing Assessment Survey

Dominant Pricing Strategy	Number of Respondents	Secondary Strategy Identified	Weighted Percent
Proportional	13	peer	12.3
Externally indexed	11	peer	18.0
Peer	37	externally indexed	13.8
Differential	3	residual	16.3
Residual	47	peer	19.4
TOTAL	100		

Note: Weighted percent is the average reported use of the secondary pricing strategy.

Table 4

Reported Enrollment Changes for  
Each Pricing Strategy

Change in Enrollment 1980 to 1985					
Pricing Strategy	Increased		Decreased		Total
	Observed	Expected	Observed	Expected	
Proportional	11	8.5	4	6.5	15
Externally indexed	2	6.6	9	4.4	11
Peer	23	20.7	13	15.3	36
Residual	27	27.2	20	19.8	47
	<hr/>		<hr/>		<hr/>
TOTAL	63	63.0	46	46.0	109
PERCENT	57.8		42.2		100.0



These results, significant at the  $<.10$  level,  $\chi^2 (3, N = 109) = 9.11$ ,  $p < .10$  lead the researcher to reject the null hypothesis that changes in enrollment had no impact on pricing strategy reported.

Table 5 displays the chief business officers' responses to the question of the impact of increasing tuition on enrollment, 44 (41.9%) institutional respondents reported that rising tuition had a negative impact on enrollment. The remaining 61 (58.1%) respondents reported that there was no impact on enrollment associated with the increases in tuition.

One expected cell value was less than five so the chi-square test was applied to the data. The null hypothesis stated that there were no differences ( $p < .10$ ) in reported impact of increasing tuition upon enrollment by institution when grouped by pricing strategy.

The results were not significant at the  $<.10$  level,  $\chi^2 (3, N = 105) = 6.06$ ,  $p > .10$ , indicating that there was not enough evidence to suggest that the tuition impact on enrollment had any effect on the selection of a pricing strategy.

Each institutional respondent was asked to identify the five most important factors used in setting tuition for the next fiscal year. A total of 475 responses was tabulated for this question. Each survey was coded to reflect the scheme of classification as displayed in Appendix 3. As expected, the five major pricing strategies were identified during this process.

A ranking of all of the responses is shown in Table 6 with a description of each classification. The peer pricing strategy was

Table 5

Impact of Increasing Tuition on Enrollment  
for Each Pricing Strategy

Pricing Strategy	Impact				Total
	Negative		No negative		
	Observed	Expected	Observed	Expected	
Proportional	7	6.3	8	8.7	15
Externally indexed	7	4.3	3	5.7	10
Peer	10	14.6	25	20.4	35
Residual	20	18.8	25	26.2	45
TOTAL	44	44.0	61	61.0	105
PERCENT	41.9		58.1		100.0

identified by 94 (19.8%) institutional leaders as one of the five most important factors in setting tuition. This confirmed earlier reported findings of the significance of this strategy. The residual strategy was identified by 63 (13.3%) of the respondents as one of the five most important factors.

The use of an external index was identified by 11.5% of the respondents as the most important factor in setting tuition. The market reaction to change in tuition, the levels and availability of financial aid, and the need for faculty and staff salaries were reported from 7.5% through 9.5% of the total responses. Proportional pricing, identified in the literature review as a pricing strategy, was reported by only 24 (5.1%) of the respondents. Those chief business officers using differential pricing identified this factor in only 13 (2.7%) responses.

#### Tests of the General Null Hypothesis

Six major categories of variables were identified as having a potential impact on the pricing strategy followed by each institution in the study population. These were endowment-related variables, revenue-related variables, enrollment-related variables, faculty-related variables, expenditure-related variables, and external factors. A complete summary of each category with the associated variables was provided in Chapter Three.

Table 6

Ranking of Most Important Pricing  
Factors as Reported in Tuition Assessment Survey

Most Important Factor In Setting Tuition	Number of Responses	Percent of Responses
Peer pricing strategy	94	19.7
Residual pricing	63	13.3
Use of an external index	55	11.5
Market reaction to change in tuition	45	9.5
Levels & availability of financial aid	44	9.3
Faculty and/or staff salary requirement	35	7.4
Proportional cost pricing	24	5.1
New programs/new equipment	21	4.4
Enrollment/economies of scale	19	4.0
Physical facility needs	17	3.6
External environment factors	13	2.7
Differential pricing	13	2.7
New/alternative tuition funding available	11	2.3
Trend in prior tuition increases	9	1.9
Quality/cost considerations	6	1.3
Cost containment	5	1.1
Collective bargaining arrangements	1	.2
TOTAL	475	100.0

Note: A complete description of factors is displayed in Appendix 3.

The reported pricing strategies were used to group the institutions to determine if there were significant differences ( $p < .10$ ) among them in regard to the 31 institutional characteristics (variables). For interval scaled data, the one-way analysis of variance (ANOVA) procedure was used in conjunction with the Duncan multiple range test. For nominal scaled data, the chi-square test was utilized. A complete summary of the categories, the test statistic used, statistical significance, and other summary data are provided in Appendix 4. As has been noted, for purposes of this analysis, the three institutions where the respondents identified differential pricing as their dominant strategy were folded into the proportional category. This was done because of the limited number of observations and the logical similarity between these two pricing strategies.

For each category of variables, a summary table was prepared to describe the results of the analysis displayed in rank order by level of significance. In each case, the following general null hypothesis was tested: There are no differences ( $p < .10$ ) among the institutions when they are grouped by institutional pricing strategy on any of the selected 31 institutional variables.

#### Endowment-Related Variables

This category consisted of sets of data which measured the endowment in terms of five different variables. Table 7 shows a complete summary of the endowment-related variables, the F test values

and the reported means for each variable. Endowment income as a percent of education and general revenue measured the relative contribution of endowment revenue to total operating income. When the institutions were grouped by the four possible pricing strategies, the difference among the four groups with regard to endowment income as a percent of education and general revenue was significant,  $F(110,111) = 4.47$ ,  $p < .10$ . The general null hypothesis, therefore, for this variable was rejected.

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) among external, residual, and peer strategies, or that there was a difference among peer and proportional strategies. The mean endowment income as a percent of education and general revenue was lowest (2.4%) for those institutions reporting the external pricing strategy and highest (7.6%) for those reporting the proportional strategy.

External	Residual	Peer	Proportional
2.4%	2.8%	6.7%	7.6%

---

The external and residual strategies differed significantly from the proportional strategy.

The endowment income per full-time equivalent student was also significant. When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to endowment income per full-time equivalent student was significant,  $F(110,111) = 3.49$ ,  $p < .10$ . The general null hypothesis, therefore, for this variable was rejected.

Table 7

Endowment-Related Variables for  
Each Pricing Strategy

Variable Description	F Value	Propor- tional	Pricing Strategy		
			External	Peer	Residual
Endowment income as % of Total E&G revenue	4.47	7.6%	2.4%	6.7%	2.8%
Endowment income per FTE student	3.49	\$ 1,973	\$ 234	\$ 818	\$ 303
Endowment per FTE student	2.30	\$26,046	\$ 3,381	\$10,694	\$ 7,368
Market value of endowment, June 30, 1981 (thousands)	1.23	\$33,040	\$11,239	\$33,247	\$17,179
Endowment fund balance as % of current fund expenditures	.90	103.7%	35.6%	82.5%	66.9%

Note: All statistics were calculated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10.)

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) among external, residual, and peer pricing strategies. However, these strategies differed significantly from the proportional strategy. The mean endowment income contribution per student was \$1,973 for proportional and averaged from \$234 through \$818 for the other three categories.

External	Residual	Peer	Proportional
\$234	\$303	\$818	\$1,973

---

Endowment per full-time equivalent student measured the relative wealth, or capitalization, of the institution. Generally, one may conclude, based upon this sample, that those institutions following the proportional pricing strategy were generally better endowed than all others. When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to endowment per full-time equivalent student was significant,  $F(110, 111) = 2.30$ ,  $p < .10$ . The general null hypothesis, therefore, for this variable was rejected.

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) among external, residual, and peer strategies, or that there was a difference between peer and proportional. The mean endowment per FTE student was \$3,381 for those institutions reporting the external pricing strategy and averaged from \$7,368 through \$26,046 for the other three categories.



External	Residual	Peer	Proportional
\$3,381	\$7,368	\$10,694	\$26,046

---

The external and residual strategies differed significantly from the proportional strategy.

The average market value of endowment at June 30, 1981, was not statistically different among the four pricing strategies. When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to market value of endowment was not significant,  $F(110,111) = 1.23$ ,  $p > .10$ . The general null hypothesis, therefore, for this variable was accepted.

The last variable in this category was endowment fund balance as a percent of total current funds expenditures. This was another relative wealth measure and the researcher expected a statistical significance. When the institutions were grouped by the four possible pricing strategies, the difference among the four groups in regard to the endowment fund balance as a percent of total current fund expenditures was not significant,  $F(110,111) = .90$ ,  $p > .10$ .

From the analysis of these five variables, endowment plays a significant role in the pricing strategy followed. Throughout the analysis, and based upon this population, those institutions following the peer and proportional strategy were more dependent on endowment as measured by the income variable and benefited from the higher endowment per student and relative endowment size.

### Revenue-Related Variables

There were seven revenue-related variables within this category. These variables were the percentage change in tuition from 1972-73 to 1980-81, total education and general revenues per FTE student, private gifts and grants per FTE student, tuition and fees as a percent of total education and general revenues, gifts and grants as a percent of total education and general revenue, tuition and fees per FTE student, and the 1986 institutional annual tuition costs. Table 8 shows a complete summary of the revenue-related variables, the F test values, and the reported means for each variable.

The percentage change in tuition for the 9-year period 1972-73 through 1980-81 indicated a significant difference among institutions. When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to the percentage increase in tuition for the 9-year period 1972-73 through 1980-81 was significant,  $F(110,111) = 2.38$ ,  $p < .10$ . The null hypothesis, therefore, for this variable was rejected.

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) in residual, peer, and external pricing strategies, or that there was a difference in external and proportional strategies.

Residual	Peer	External	Proportional
140.0%	147.9%	152.0%	190.0%

---

The residual and peer strategies differed significantly from the proportional strategy.

Differences in total education and general revenues per full-time equivalent student were slightly above the threshold of .10 level of significance. When the institutions were grouped by the four possible pricing strategies, the difference among the four groups with regard to education and general revenues per FTE student was not significant,  $F(110,111) = 2.1, p > .10$ . The null hypothesis, therefore, for this variable was accepted.

Since the results of the F test were very close to the significance level of .10, the Duncan test indicated that there was not enough evidence in the data to indicate a significant difference ( $p < .05$ ) among residual, external, and peer pricing strategies, or that there was a significant difference among external, peer, and proportional strategies.

Residual	External	Peer	Proportional
\$8,911	\$9,640	\$10,516	\$18,184

---

The residual strategy differed significantly from the proportional strategy. Proportional had average revenues of \$18,184 per student while residual had a mean of \$8,911 per student. Given this range, one may conclude that there was a difference between the relative level of revenues for these two categories.

Private gifts and grants per full-time equivalent student showed a large range of values, most notably between proportional and residual. When the institutions were grouped by the four pricing

Table 8

Revenue-Related Variables  
for Each Pricing Strategy

Variable Description	F Value	Pricing Strategy			
		Propor- tional	External	Peer	Residual
% Change in tuition 72-73 through 80-81	2.38	190.0%	152.0%	147.9%	140.0%
Total E&G revenues per FTE student	2.10	\$18,184	\$9,640	\$10,516	\$8,911
Private gifts & grants per FTE student	2.03	\$ 6,656	\$ 709	\$ 1,059	\$ 538
Tuition & fees as % of total E&G revenue	1.90	53.5%	59.2%	56.2%	61.2%
Gifts & grants as % of total E&G revenue	1.72	10.0%	7.1%	9.0%	5.9%
Tuition & fees per FTE student	.31	\$ 5,381	\$5,381	\$ 5,647	\$5,275
Annual tuition costs fall 1986	.12	\$ 6,492	\$6,745	\$ 6,740	\$6,791

Note: All statistics were calculated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10).

strategies, the differences among the four groups with regard to private gifts and grants per FTE student was not significant,  $F(110,111) = 2.03, p > .10$ .

Since the results of the F test were very close to the significance level of .10 the Duncan test indicated that there was not enough evidence in the data to indicate that there was a difference in residual, external, and peer pricing strategies, or that there was a difference in external, peer, and proportional strategies.

Residual	External	Peer	Proportional
\$538	\$709	\$1,059	\$6,656

---

There was a difference between the residual and proportional pricing strategy. This confirmed the results of the previous variables because this variable would be included in the total education and general revenues. It appeared that those institutions following proportional pricing had significant outside income sources beyond tuition. This was supported by the variable of tuition and fees per student and the variable annual tuition costs. These variables indicated no significant differences in the amount of tuition charged to the students in both relative and absolute measures.

The variables of tuition and fees,  $F(110,111) = 1.90, p > .10$ , and private gifts and grants,  $F(110,111) = 1.72, p > .10$ , as a percent of total education and general revenues, showed no significant differences among the mean values. This indicated that in all pricing categories tuition and fees provided about the same relative share of total income.

There were no statistical differences in the tuition and fees per full-time equivalent student,  $F(110,111) = .31, p > .10$ , and the annual tuition costs effective fall 1986,  $F(110,111) = .12, p > .10$ . This was an interesting result in that one might have anticipated differences due to the pricing strategy in place. This did indicate, however, that regardless of pricing strategy followed, the average tuition charged was, within this group of institutions, approximately the same. These small differences in average tuition and fees and the annual tuition costs for fall 1986 support the premise that tuition pricing is critical for private comprehensive universities from a competitive perspective. It was interesting to note here that these institutions under analysis had tuition revenues as a percent of total revenues approximating the same as nationally reported data.

For the comparative period the gifts and grants as a percent of total revenues were in excess of nationally reported data by the National Center for Education Statistics (1986). Since the composition of institutions making up the reported population was unknown and access to the underlying data was limited, no statistical conclusions could be drawn. Table 1 displayed the aggregate financial revenue summary for private and public comprehensive universities for the 1983-84 reporting period.

#### Enrollment-Related Variables

This category contained three interval variables related to enrollment. The one-way ANOVA procedure was used to determine if there were any statistical differences among pricing strategy for the

variables of total full-time equivalent enrollment, total headcount enrollment, and full-time equivalent enrollment as a percentage of total headcount enrollment. Table 9 provides a summary of the enrollment-related variables with the F values and means of the reported data.

The general null hypothesis stated that there are no differences ( $p < .10$ ) among the institutions when they are grouped by institutional pricing strategy on any of the 31 selected institutional variables.

For all of the variables within this category the results were not significant. When the institutions were grouped by the four possible pricing strategies, the difference among the four groups with regard to total head enrollment was not significant,  $F(110,111) = 1.99$ ,  $p > .10$ . The same results were found for total FTE enrollment,  $F(110,111) = 1.80$ ,  $p > .10$  and for the ratio of FTE to total headcount enrollment,  $F(110,111) = .16$ ,  $p > .10$ .

Based upon the evaluation of all the variables within this category, it appears that enrollment-related factors had little or nothing to do with the pricing strategy followed. The research expectations were that differences would be shown in this category. In an earlier study by Chisholm and Cohen (1982), it was found that levels of enrollment were subject to variation based upon the complex interaction of tuition price, institutional quality, and the mix of part-time and full-time students.

Table 9

Enrollment-Related Variables  
for Each Pricing Strategy

Variable Description	F Value	Pricing Strategy			
		Propor- tional	External	Peer	Residual
Total headcount enrollment	1.99	3,706	4,590	3,276	4,563
Total FTE enrollment	1.80	2,921	3,830	2,703	3,441
FTE as % of total student enrollment	.16	83.0%	84.4%	84.3%	81.8%

Note: All statistics were calculated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10)



### Faculty-Related Variables

Faculty-related variables included measures of the number of tenured 9-month faculty, weighted average 9-month faculty salary, number of 9-month faculty, and the tenure ratio for each institution. Based upon the literature review and the justifications used for increasing tuition, it was anticipated that differences might be found in these variables by pricing strategy. Table 10 provides a summary of the faculty-related variables, F values, and the means for each variable. The null hypothesis stated that there were no differences in the means of these reported data at the .10 level of significance. When the institutions were grouped by the four possible pricing strategies, the difference among the four groups with regard to the number of tenured 9-month faculty was not significant,  $F(110,111) = .46, p > .10$ .

Based upon the same analysis of weighted average 9-month salary the results were also found not significant,  $F(110,111) = .40, p > .10$ . Neither the number of 9-month faculty,  $F(110,111) = .37, p > .10$ , nor the percentage of tenured 9-month faculty,  $F(110,111) = .20, p > .10$ , were statistically significant.

The tenure percentages and overall salary averages were within a tight range for all pricing strategy groups of private comprehensive universities. The range of highest to lowest salaries was about \$2,000 reflecting the general parity of salaries within this institutional group. This researcher did not utilize total compensation, which includes benefit costs, due to the difficulty in securing this information by institution.

Table 10

Faculty-Related Variables  
for Each Pricing Strategy

Variable Description	F Value	Pricing Strategy			
		Propor- tional	External	Peer	Residual
Number of tenured 9-month faculty	.46	85.6	87.2	77.4	94.0
Weighted average 9-month faculty salary	.40	\$21,552	\$21,564	\$23,570	\$22,900
Number of 9-month faculty	.37	135.6	143.5	132.5	154.2
% of 9-month faculty tenured	.20	53.8%	48.1%	53.7%	54.0%

Note: All statistics were calculated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10)

### Expenditure-Related Variables

There were seven expenditure variables analyzed within this category. These variables measured the total education and general expenditures per FTE student, academic support per FTE student, instructional costs per FTE student, instructional costs as a percent of total education and general expenditures, institutional student aid as a percent of total education and general expenditures, student financial aid per FTE student, and financial aid as a percent of tuition. Table 11 shows a summary of the expenditure-related variables, F values, and the mean data reported for each variable.

When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to education and general expenditures per FTE student were not significant,  $F(110,111) = 2.11$ ,  $p > .10$ . The null hypothesis, therefore, for this variable was accepted.

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference in residual, external and peer strategies or that there was a significant difference ( $p < .05$ ) in external, peer, and proportional strategies.

Residual	External	Peer	Proportional
\$7,179	\$7,591	\$8,607	\$15,706

---

There was a significant difference between residual and proportional pricing strategies.

Table 11

Expenditure-Related Variables for  
Each Pricing Strategy

Variable Description	Pricing Strategy				
	F Value	Propor- tional	External	Peer	Residual
Total E&G expenses per FTE student	2.11	\$15,706	\$7,591	\$8,607	\$7,179
Academic support per FTE student	1.93	\$ 1,928	\$ 539	\$ 732	\$ 607
Instructional cost per FTE student	1.91	\$ 4,155	\$3,230	\$3,123	\$2,799
Instruction as % of total E&G expenditures	1.91	37.4%	41.8%	36.4%	38.1%
Institutional student aid as % of total E&G expenditures	.81	12.0%	14.1%	13.1%	13.9%
Student aid per FTE student	.26	\$ 661	\$ 690	\$ 727	\$ 651
Financial aid as % of tuition	.19	13.1%	13.2%	14.2%	12.6%

Note: All statistics were calculated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10)

When the institutions were grouped by the four possible pricing strategies, the differences among the four groups with regard to academic support per FTE student were not significant  $F(110,111) = 1.93$ ,  $p > .10$ . Instruction costs per FTE student were not significant  $F(110,111) = 1.91$ ,  $p > .10$ , but the Duncan test indicated differences in two subsets. There was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) in residual, peer, and external pricing strategies, or that there was a difference in peer, external, and proportional strategies.

Residual	External	Peer	Proportional
\$2,799	\$3,123	\$3,230	\$4,155

---

There was a significant difference between the residual and proportional pricing strategies.

Instruction costs as a percent of total education and general expenditures did not show any statistical difference,  $F(110,111) = 1.91$ ,  $p > .10$ . The range of means was from 37.4% for proportional through 41.8% for the external category. The overall percentage commitment to instruction was 37.8% which approximates other reported national data for these institutions. One may conclude that, across pricing strategies, these institutions made approximately the same commitment to both academic support and instructional costs.

Based upon the Duncan test there was not enough evidence in the data to indicate that there was a significant difference ( $p < .05$ ) in peer, proportional, and residual pricing strategies, or that there was a difference in proportional, residual, and external pricing strategies.

Peer	Proportional	Residual	External
36.4%	37.4%	38.1%	41.8%

---

There was a significant difference between peer and external pricing strategies.

The three variables related to institutionally-based financial aid were student aid as a percent of education and general expenditures, student aid per full-time equivalent student, and financial aid as a percent of tuition. These variables measured the relative institutional commitment to financial aid and the relative discounting of tuition revenues.

When the institutions were grouped by the four possible pricing strategies, the difference among the four groups with regard to these three financial aid measure were not significant. No statistical difference was observed in institutional financial aid as a percent of total education and general expenditures,  $F(110,111) = .81, p > .10$ ; student financial aid per FTE student,  $F(110,111) = .26, p > .10$ ; and financial aid as a percent of tuition,  $F(110,111) = .19, p > .10$ .

No statistical differences were observed in these three variables among each pricing category, indicating that the institutions were making very similar financial aid commitments and relative level of expenditures. This is confirmed by the small range of means for these variables as depicted in Table 11.

The results of the evaluation of the expenditure-related variables indicate that these variables do not appear to have any significant differences among pricing strategy. Although, 16

respondents (14.4%) indicated either a proportional cost or differential cost pricing strategy, the results did not indicate a significant difference in the underlying major cost components. This, however, should not lead to the conclusion that costs are not considered during the process of setting tuition.

### External Factors

The last category considered variables external to the institution. Three variables were evaluated as part of this component. These were regional market share, 1979 median family income for each state, and enrolled students as a percent of total applications. Shown in Table 12 are the data related to median family income and enrolled students as a percent of total applicants.

Median family income for 1979 was not statistically different when the institutions were grouped by the four possible pricing strategies,  $F(110,111) = 1.87, p > .10$ . It was interesting to note, however, that the externally indexed pricing strategy had the highest level of median family income. Intuitively, this is correct because cost of living and other indices are used as a basis for adjusting tuition, and median family income is adjusted accordingly.

There was no statistical difference in the percentage of enrolled students to total applications,  $F(110,111) = .28, p > .10$ . This would imply that, on average, these institutions were approximately the same in the selectivity of students. This does not appear to have had any influence on the pricing strategy selected.

Table 12

External Factor Variables  
for Each Pricing Strategy

Variable Description	F Value	Pricing Strategy			
		Propor- tional	External	Peer	Residual
1979 median family income by state	1.87	\$20,189	\$21,528	\$20,512	\$20,247
Enrolled students as % of applicants	.28	35.7%	36.9%	37.6%	34.7%

Note: All variables were evaluated using the ANOVA procedure.  
 (110 degrees of freedom, sample size of 111, and significance  
 level of .10)



For purposes of evaluating the importance of market share, which was defined for this study as the percentage of private enrollment within the region, the chi-square procedure was used. The null hypothesis stated that there were no differences in market share when institutions are grouped by pricing strategy ( $p < .10$ ).

The review of the literature identified market share as an important factor in setting tuition. The United States Department of Education divides the United States into eight regions. Based upon data secured from the Digest of Education Statistics (1987), the regional market share was computed by dividing the number of students enrolled in private colleges and universities by the total number of students, both public and private, within the region.

Table 13 shows the computed market share percentage for each of the eight regions. The results indicated that the northeast and mid east dominate the relative levels of private education with market shares of 49.3% and 38.3% respectively. The great lakes, plains, southeast, and rocky mountain areas all have approximately 18% and 22% private enrollment. The far west and southwest have the smallest market share with 12.3% and 10.8% respectively. For purposes of this study, it was decided to collapse these eight regions into two major categories based upon the logical distribution and the natural breaks in the data. They were defined as higher than average market share, and lower than average market share.

Table 14 shows the results of market share data by pricing strategy reported. There were no expected cell values less than five. The null hypothesis stated that there are no differences in market share by institution when grouped by tuition pricing strategy ( $p < .10$ ).

Table 13

Private Market Share by Region

Region	Private Market Share	Classification
New England	49.3%	Higher than Average
Mid East	38.3%	
Plains	22.3%	Lower than Average
Great Lakes	20.7%	
Rocky Mountains	18.1%	
Southeast	17.9%	
Far West	12.3%	
Southwest	10.8%	
Overall	22.7%	

Table 14

Private Market Share  
for Each Pricing Strategy

<u>Pricing</u> <u>Strategy</u>	Market Share				
	Higher than		Lower than		
	Average		Average		Total
	Observed	Expected	Observed	Expected	
Proportional	9	7.5	7	8.5	16
Externally indexed	4	5.2	7	5.8	11
Peer	12	17.3	25	19.7	37
Residual	27	22.0	20	25.0	47
TOTAL	52	52.0	59	59.0	111
PERCENT	46.8		53.2		100.0

The results of the chi-square test were significant at the  $p < .10$  level,  $\chi^2(3, N = 105) = 6.26, p < .10$ . These results indicated the null hypothesis should be rejected and the alternative hypothesis accepted that there is a difference in market share when the institutions are grouped by tuition pricing strategy.

A clear distinction emerged between peer and residual pricing strategies. Over half of those institutions adopting the residual strategy were in areas of higher than average market share while peer institutions had the most reported in the lower than average market share regions. One might assume that in those institutions where the policymakers used the externally indexed strategy there was not as much concern with the relative price of private education within the region. Those institutions reporting a proportional strategy tended to be in areas of higher than average market share.

Specifically, 27 out of 52 respondents (52%) indicated that their institutions fall in higher than average market share regions and follow the residual pricing strategy. This implies less emphasis or concern for the pricing among competitors. Also, the costs of the total institutional operations were considered in the pricing decision.

Twenty-five out of 59 respondents (43%) following the peer pricing strategy fell in the lower than average market share regions. This implied an increased sensitivity to price of tuition when the regional market share was low or when a greater number of public institutional alternatives existed. This confirmed other reported

information that region of the country tended to have an impact on both the level of tuition and type of strategy followed.

These findings confirm earlier results by Rusk and Leslie (1978) regarding the impact of geographic location on the establishment of tuition price. Although this study pertained to pricing strategies as contrasted to the actual amount of tuition, it was an important finding that market share was a significant factor considered in the tuition pricing decision.

#### Summary of Significant Differences

A summary of the major findings of the study determined to be statistically significant is displayed on Table 15. A discussion of these findings, as well as a review of other items not found to be significant, is included in Chapter Five. A complete summary of all variables analyzed is shown in Appendix 4.

Table 15

Summary of Statistically Significant Findings of Institutional  
Variables for Each Pricing Strategy

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Variable Description	F Value	Significance
Endowment income as % of total E&G revenue	4.47	.01
Endowment income per FTE student	3.49	.02
% change in tuition 1972-73 through 1980-81	2.38	.07
Endowment per FTE student	2.30	.08
	Chi-square Value	Significance
5-year change in undergraduate enrollment	9.11	.02
Regional market share	6.26	.09

---

## CHAPTER FIVE SUMMARY AND DISCUSSION

### Introduction

The purpose of this study was to identify the dominant pricing strategy utilized by policymakers in private comprehensive college and universities and to identify those institutional variables which may influence the tuition pricing strategy followed. The 31 institutional variables were grouped into six categories defined as endowment, revenue, enrollment, faculty, expenditure, and external factors. The general null hypothesis used to evaluate these categories stated that there were no differences ( $p < .10$ ) among the institutions when they were grouped by institutional pricing strategy on any of the 31 institutional variables.

From the review of the literature, covering predominantly the period of 1965 to the present, five dominant pricing strategies in use were identified. These were proportional cost pricing, externally indexed pricing, peer pricing, differential pricing and residual pricing. For purposes of this study, the differential pricing group was combined with the proportional group due to the small sample size and the underlying similarity of the groups which were cost based.

An 8-item survey instrument was designed and distributed to chief business officers at 160 private comprehensive colleges and

universities. The statistical data analyses were based on 111 usable responses. Data from each institution for 31 identified quantitative variables were analyzed to determine the differences existing among the institutions when grouped by tuition pricing strategy. Responses from the survey and the associated variables were compiled and subjected to statistical analyses designed to test the general null hypothesis and identify the dominant pricing strategy.

Mean values for each interval variable were calculated and analyzed using the one-way analysis of variance (ANOVA) procedure with a follow-up Duncan test ( $p < .05$ ). For those variables having a nominal scale, the chi-square statistic was used. Statistically significant results were reported at the  $p < .10$  level. If a significant value was determined for a particular variable (less than .10), it was assumed that the probability of the sample variable occurring by chance, if the population means were equal, was less than 10%. In these cases, the general null hypothesis was rejected and the alternative hypothesis accepted. The alternative hypothesis stated that there were differences among the institutions when they are grouped by institutional pricing strategy on any of the 31 institutional variables.

The 31 variables were grouped into six major categories consisting of endowment, revenue, enrollment, faculty, expenditure, and external related variables. A summary of these categories is provided in Appendix 4. Statistically significant results were determined for six different variables based upon the one-way ANOVA and chi-square procedure. A summary of these significant variables

was shown on Table 16. There were other variables discussed in Chapter Four that were not statistically significant, but appeared to provide a fairly strong distinction between pricing strategies. Further research efforts could clarify these results.

### Discussion

The survey results from 111 respondents indicated two dominant pricing strategies. Residual pricing was identified by 42.4% of the respondents while peer pricing was used by 33.3% of the chief business officers. Together these two strategies accounted for over 75% of the respondents and, coupled with the secondary strategies identified, were clearly the most important pricing strategies in use by private comprehensive colleges and universities. This confirmed earlier research by VanAlstyne (1977), Johnson (1979), and Hopkins and Massy (1981). To a much lesser degree, proportional (11.7%), externally indexed (9.9%), and differential (2.7%) were identified. The use of residual pricing as the most identified strategy confirmed the findings of Ihlanfeldt (1981). In these institutions tuition was set to balance the annual operating budget within the context of remaining price competitive with other private comprehensive colleges and institutions.

The use of peer pricing as a major pricing strategy clearly indicated the market's sensitivity to the price of tuition. This was confirmed by the survey results which indicated that the market



reaction to changes in tuition was a significant consideration by those responsible for setting tuition. It was anticipated that the differential strategy would have been reported by a higher number of respondents. The research results were consistent with private comprehensive colleges and universities which generally did not have specialized differential priced programs such as law and medicine. Although not statistically significant, those institutions following the external pricing strategy were associated with the highest levels of median family income. It is logical to assume that this relationship does exist due to the use of this measure in various published indices.

It was interesting to note that many of the items stressed publicly as reasons for increasing tuition were not highly ranked by the survey respondents in the listing of much important factors. These included new programs and equipment, quality improvement, and quality consideration. Future researchers might specifically identify a set of factors and produce a survey to elicit these responses. It had been anticipated that these factors would have been identified by many more of the institutional respondents. (Association of Governing Boards of Colleges and Universities, 1986)

The most important statistical results were in endowment-related categories. Throughout the literature review, the topic of endowment and its impact on an institution was rarely mentioned in the context of pricing strategy. Endowment as a broad measure reflected the capitalization of the institution and allowed the institution to provide improved educational and support services.

Included in this category were faculty development, specialized research, and student financial aid.

Endowment income as a percent of total education and general revenue was the most significant factor associated with a pricing strategy. Those institutions following the proportional strategy had the greatest relative use of endowment income as a supplement to tuition income and were significantly different from institutions using the externally indexed or residual methods. This was confirmed by the measure of endowment income per student and the endowment per student.

The conclusions drawn from these results are that policy-makers using the proportional pricing method relied on endowment income to provide a much more significant contribution to income than those identifying the external or residual strategy. The proportional category was also significantly different from the external, residual, and peer categories in terms of endowment income per FTE student. This confirms the emphasis placed by policymakers in institutions following the proportional strategy on the use of endowment funds to support current levels of expenditure.

The level of endowment per FTE student was also significantly different between those institutional respondents identifying the proportional strategy and those following the externally indexed or residual strategies. This measure of relative institutional wealth enabled those institutions the following proportional strategy to remain price competitive while providing a higher level of expenditures per student.

Those institutions with these higher levels of endowment also reported the largest commitment of total expenditures per FTE student. This confirmed the ability of those institutions, on average, to provide services to students over and above basic instructional services traditionally linked to tuition.

The distinction continues when evaluating total education and general revenues. The proportional strategy was statistically different than the residual category, but the mean dollar differences of education and general revenues per FTE student were more apparent. The proportional group had total revenues on average more than twice that of the residual group.

The 5-year change in undergraduate enrollment was significantly different among pricing strategies when evaluated by the chi-square test. Those institutions having increases in enrollment above the expected were proportional and peer. The group identified as externally indexed had experienced a decline in enrollment over the 5-year period. The residual group had reported responses approximately equal to the expected responses. It appeared from these data that during this time period the institutions following proportional, peer, and residual strategies were more successful in stabilizing or increasing enrollment than the institutions reporting externally indexed strategy.

The proportional pricing group of institutions segmented revenues quite effectively, keeping tuition charges about the same as other pricing categories but providing total expenditures at substantially higher levels. Also, private gifts and grants were significantly higher per student for this group of institutions.

Another significant conclusion to be drawn from the research was the effect of market share on the selection of the pricing strategy. Mulvihill and Paranka (1967) indicated the importance of market share in dealing with the issue of pricing. For purposes of this study regional market share was defined as the percentage of enrolled students in private colleges and universities to total students, both public and private, within the eight national regions (Table 13). Rusk and Leslie (1978) concluded that in states with high market share, average tuitions were higher. This research clearly identified two major groups as discussed in Chapter Four. Peer pricing institutions tended to be found in areas of lower than average market share where sensitivity to price is more important. Residual institutions tended to fall in higher than average market share areas, implying a greater ability to pass on to students the costs of education.

The percentage change in tuition and fees over the 9-year period 1972-1973 through 1980-1981 was a significant variable in differentiating those institutions following the proportional strategy from those following either peer or residual strategies. The proportional group, basing tuition on some component, primarily instructional, had the higher rate of increase (190%); however, the current level of tuition and fees for all groups of institutions was about the same with no statistical difference. This implied that the 1972-1973 level of tuition was below the average for the proportional group of institutions. Given the substantial increases in the underlying cost categories, those institutions basing tuition on this

within this group to match particular costs to certain revenues. As discussed earlier, this group had the highest endowment support and the highest level of expenditures per full-time equivalent student.

There were a number of other variables analyzed that were not statistically different at the  $<.10$  level. The most significant of these were tuition and fees per full-time equivalent student. It was anticipated that this variable would be different for each pricing strategy. The mean value for this variable of all institutions when grouped by pricing strategy was essentially the same. This leads one to conclude that the absolute amount of tuition charged was not a significant factor in the adoption of a pricing strategy. It appeared to be more important to have tuition that was similar to other institutions in the competitive marketplace.

In addition, gifts and grants were about the same for each group of institutions. The percentage contribution to total revenues ranged from 5.9% to 10.0% but the population means were not statistically different. This confirmed earlier reported data that this category of funding provided a significant addition to tuition as a revenue source for private comprehensive colleges and universities as shown in Table 1 of this study.

It was expected that student financial aid would differ by pricing strategy group, but the means for these data were remarkably similar. This was supported by the relatively equal discounting of tuition for each group. Financial aid, therefore, does not appear to have a direct impact on the selection of a pricing strategy.

Another important finding was the enrollment measures of

current FTE enrollment, headcount enrollment, and the headcount FTE ratio were not significantly different among institutions when grouped by the four pricing strategies. This would indicate that these institutions were not significantly different in average size and that their size did not appear to have an impact on the tuition pricing strategy.

In summary, based upon this study of private comprehensive colleges and universities, there appeared to be only six variables that were significantly different among the pricing strategies identified. Endowment-related variables of endowment income as a percent of total educational and general revenue, endowment income per student, and the level of endowment per student were the most significant groupings.

The regional market share was statistically different among institutions when they were grouped by tuition pricing strategy. The 5-year change in enrollment was also statistically different among institutions when they were grouped by tuition pricing strategy.

Finally, total expenses and revenues per FTE student were statistically different among groups. The expense and revenue factor distinguished between residual and proportional pricing strategies. This outcome was anticipated because these institutions were operated on a not-for-profit basis.

### Implications for Future Research

In view of the findings of this study, four areas of investigation may be considered for future research.

1. What is the feasibility for institutions to segregate their cost components and price them separately? Would this conflict with the concept of the whole institution, and what would be the student reaction?

2. Are there significant differences between the level of services offered by similar groups of institutions? That is, can one determine differences in price computed on a base price and additives for other services such as academic support, athletics, and physical plant?

3. How uniquely can institutions with high levels of endowment, relative to the average for a group of universities, operate in the market place? Are there quality or economic differences in these groups?

4. What are the economic differences and quality differences associated with those institutions where tuition is significantly higher than the average? Is the student consumer receiving a satisfactory return on the education investment?

The pricing of tuition will be one of the most discussed topics on the future research agenda. Private comprehensive colleges and universities will continue to be at a competitive disadvantage in terms of tuition price until such time as public subsidies increase, public tuition increases, or significant private support for

financial aid becomes available. The development of an institutional planning model which takes into consideration the factors identified in this study would assist policymakers in the tuition pricing decision.



APPENDIX 1  
ALPHABETICAL LIST OF PRIVATE COLLEGES  
AND UNIVERSITIES USED IN STUDY

PRIVATE COMPREHENSIVE COLLEGES AND UNIVERSITIES  
AS CLASSIFIED BY MANKOWSKI (1979)  
WITH 1983 HEAD COUNT ENROLLMENT

Headcount Enrollment	Institution
4562	Abilene Christian University TX
1646	Alfred University NY
2050	American International College MA
524	American Technological University TX
2878	Andrews University MI
1641	Anna Maria College MA
3611	Antioch University OH
3077	Ashland College OH
2809	Assumption College MA
1065	Atlanta University GA
2341	Azusa Pacific University CA
3368	Barry University FL
3083	Biola University CA
5604	Bradley University IL
6413	Bridgeport, University of CT
3264	Bucknell University PA
4058	Butler University IN
2450	Cal Lutheran College CA
3052	Campbell University NC
4119	Canisius College NY
6289	Chapman College CA
2631	Colgate University NY
1727	Connecticut College CT
6301	Creighton University NE
2594	Dallas, University of TX
4660	Dartmouth College NH
10413	Dayton, University of OH
12447	Depaul University IL
2403	Depauw University IN
4367	Detroit, University of MI
710	Dominican College of San Rafael CA
6008	Drake University IA
12682	Drexel University PA
6362	Duquesne University PA
2399	Elmira College NY
2214	Emerson College MA
4626	Evansville, University of IN
5242	Fairfield University CT
3666	Fairleigh Dickinson University Rthfd NJ
7028	Florida Institute Technology FL
3033	Furman University SC

Headcount Enrollment	Institution
1350	Gallaudet College DC
4104	Gannon University PA
1214	George Williams College IL
151	Goddard College VT
11153	Golden Gate University CA
3393	Gonzaga University WA
4063	Hampton Institute VA
1927	Hardin-Simmons University TX
8062	Hartford, University of CT
307	Heritage College WA
655	Holy Names College CA
1801	Hood College MD
1416	Incarinate Word College TX
3168	Indiana Central University IN
6186	Iona College NY
5252	Ithaca College NY
2270	Jacksonville University FL
112	Jewish Theology Seminary NY
1652	John F Kennedy University CA
3681	John Carroll University OH
4349	La Verne, University of CA
2811	Lewis University IL
3037	Lewis and Clark College OR
1848	Lindenwood College MO
4047	Loma Linda University CA
7052	Long Island U Brooklyn Campus NY
5652	Loyola College MD
6446	Loyola Marymount University CA
4856	Loyola University New Orleans LA
2207	Lynchburg College VA
4882	Manhattan College NY
1315	Manhattanville College NY
1237	Marygrove College MI
3116	Marywood College PA
2880	Mercer University Main Campus GA
903	Mills College CA
2908	Mississippi College MS
4138	Monmouth College NJ
418	Monterey International Studies CA
7201	New Haven, University of CT
3518	NY Institute Technology City Campus NY
9103	NY Institute Technology Main Campus NY
3590	Niagara University NY
1254	Notre Dame, College of CA
2767	Oklahoma City University OK
4351	Oral Roberts University OK

Headcount Enrollment	Institution
1758	Our Lady of Lake University San An TX
3706	Pace University Pleasantville Campus NY
4824	Pace University White Plains Campus NY
5580	Pacific, University of CA
1051	Pacific University OR
3533	Pacific Lutheran University WA
192	Pacific Oaks College CA
104	Paper Chemistry, Institute of WI
6675	Pepperdine University CA
1136	Phillips University OK
2847	Portland, University of OR
3796	Pratt Institute NY
5892	Providence College RI
4198	Puget Sound, University of WA
1504	Quachita Baptist University AR
4499	Richmond, University of VA
4134	Rider College NJ
2285	Rivier College NH
15133	Rochester Institute of Technology NY
3509	Rollins College FL
6583	Roosevelt University IL
1635	Rosary College IL
3105	Russell Sage College Main Campus NY
2740	Saint Bonaventure University NY
1264	Saint Francis College IN
1289	Saint Joseph College CT
6061	Saint Joseph's University PA
3041	Saint Mary's College of CA
1425	Saint Mary's College MN
3232	Saint Mary's University San Antonio TX
2000	Saint Michael's College VT
1591	Saint Rose, College of NY
2068	Saint Thomas, University of TX
5959	Saint Thomas, College of MN
5129	San Diego, University of CA
5618	San Francisco, University of CA
4042	Samford University AL
7383	Santa Clara, University of CA
1065	Sarah Lawrence College NY
656	School for International Training VT
4801	Scranton, University of PA
4634	Seattle University WA
9423	Seton Hall University NJ
3049	Simmons College MA
2889	Smith College MA
1115	Spalding University KY

Headcount Enrollment	Institution
2368	Springfield College MA
2782	Stetson University FL
6341	Suffolk University MA
6878	Texas Christian University TX
1991	Trinity College CT
3027	Trinity University TX
5937	Tulsa, University of OK
3400	Tuskegee Institute AL
3431	Union College NY
4180	Valparaiso University IN
11728	Villanova University PA
2311	Wagner College NY
4818	Wake Forest University NC
5093	Webster University MO
3073	Wesleyan University CT
1378	West Coast University CA
1765	Western Maryland College MD
5168	Western New England College MA
2475	Wheaton College IL
1541	Whittier College CA
1884	Whitworth College WA
2827	Wilkes College PA
7058	Xavier University OH

APPENDIX 2  
LETTER MAILED TO THE CHIEF BUSINESS OFFICER,  
SURVEY INSTRUMENT, AND FOLLOW-UP LETTER



Vice President for Financial Administration

August 1, 1986

Dear

I am carrying out a research project in which Chief Business Officers at 160 private comprehensive colleges and universities are being surveyed to assess tuition pricing strategies followed in the annual adjustment of tuition. These institutions were selected for analysis because most of them are highly dependent upon tuition as the major revenue source.

The attached survey instrument has been sent to each university in this group. Your response by September 1, 1986, would be most appreciated. All responses will be held in the strictest of confidence, and in no case will the final results be identified at the university level.

If you have any questions with regard to this study please feel free to call me collect at (513) 745-3445. Again, your cooperation in completing this survey is most appreciated. At the completion of this research effort I will be delighted to share the results with you.

Thank you very much for your assistance.

Sincerely,

J. Richard Hirté, CPA  
Vice President

JRH/jr  
Enclosure

# AN ASSESSMENT OF TUITION PRICING STRATEGIES

Institution Name and Address:

FICE Code

For the purposes of this survey would you please use the following definitions:

Proportional Cost Pricing: Tuition is set to cover a certain % of the total budget or specific costs within the budget, e.g., tuition is related to the costs of instruction and academic support, etc.

Externally Indexed Pricing: Tuition is set according to an index such as the CPI or Higher Education price index, e.g., the CPI has increased by 6.2%; therefore tuition will be increased 2 points over the index or 8.2%.

Peer Pricing: Tuition is set by comparing the tuition increases at your major competition or by "benchmarking" your tuition to other universities or group averages, e.g., tuition should be a certain % or dollar difference from a target school.

Differential Pricing: Tuition differs by program to reflect differences in instructional costs or differences in perceived value of the program, e.g., students in engineering may pay a higher tuition than students in liberal studies or education.

Residual Pricing: The tuition is set to balance the budget after all other sources are considered, e.g., it would take a 10.5% increase in tuition to produce a balanced budget.

- Which of the following best describes the dominant pricing strategy used by your institution during the last budget development cycle.

*****	Proportional Cost Pricing	_____
* Select only one *	Externally Indexed Pricing	_____
*****	Peer Pricing	_____
	Differential Pricing	_____
	Residual Pricing	_____

- Is the above pricing strategy essentially the same as that used by your institution 5 years ago?

Yes \_\_\_\_\_ No \_\_\_\_\_



If no, what strategy did you use five years ago?

*****	Proportional Cost Pricing	_____
* Select only one *	Externally Indexed Pricing	_____
*****	Peer Pricing	_____
	Differential Pricing	_____
	Residual Pricing	_____

3. Some universities may utilize a combination of pricing strategies to arrive at the new tuition figure. If your university does use some combination of pricing strategies please indicate your best estimate of the relative percentage of these strategies as used in the development of your tuition.

Proportional Cost Pricing	_____
Externally Indexed Pricing	_____
Peer Pricing	_____
Differential Pricing	_____
Residual Pricing	_____
TOTAL	100 %

4. To what extent has your undergraduate enrollment changed over the last 5 years?

Increased 5% or more	Increased 1% to 5%	Remained about the same	Decreased by 1% to 5%	Decreased 5% or more
----------------------------	--------------------------	-------------------------------	-----------------------------	----------------------------

5. What impact do you think increasing tuition and fees has had on your undergraduate enrollment?

Major Negative Impact	Some Negative Impact	No Impact	Some Positive Impact	Major Positive Impact
-----------------------------	----------------------------	-----------	----------------------------	-----------------------------

6. In establishing your tuition for the next fiscal year what are the five most important factors you considered?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

7. What is your total full-time tuition & fees (Fall 1986) for undergraduates? \$ \_\_\_\_\_ /semester, quarter.  
(as published in your catalog)

8. For the latest admission period for undergraduates, what was the percentage of new enrolled students to total applications?

\_\_\_\_\_ %

9. Comments:

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10. Would you like a copy of the survey response? \_\_\_\_ yes \_\_\_\_ no



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Vice President for Financial Administration

September 26, 1986

"name  
"title1  
-title2  
"school  
-add1  
-add2  
"city

Dear "sal:

On August 1 you received a brief survey instrument asking for information on the tuition pricing strategy followed at "school<.

The initial response rate was over 60% returned by the deadline of September 1, but given the rather limited survey population (160 Colleges & Universities), it would be most helpful to achieve a higher number of completed responses. Your response will be held the strictest confidence and no data collected will be identified in the final results by institution.

My records indicate that the initial survey was not returned and I am enclosing another survey for your response. Please take a few moments to complete this brief instrument. I really appreciate your help in returning the enclosed survey by mid October. Please indicate on the survey if you would like a summary of the results.

Sincerely,

J. Richard Hirté

JRH/jr

APPENDIX 3  
RESPONSE SUMMARY FOR IMPORTANT  
TUITION PRICING FACTORS

CODING SHEET--SURVEY QUESTION #6  
Most Important Factors in Establishing Tuition

1. Proportional Cost Pricing
  - relationship of tuition to other sources
  - tuition revenue as a target percent of total revenues
  - mandatory expenses
  - covering instructional costs
  - tuition to cover certain percent of E&G expenditures
  - tuition & fees cover 100% of compensation
  - costs of non-faculty services (student support, etc.)
2. Externally Indexed Pricing
  - CPI increment anticipated
  - Higher Education Price Index
3. Peer Pricing
  - tuition compared to other affiliated institutions
  - peer institutions prices
  - remain slightly below peer institutions in region
  - faculty & staff salaries relative to other institutions
  - ranking of tuition w/other institutions
4. Differential Pricing
  - educational program costs
  - differential costs of programs
  - value of academic program

5. Residual Pricing

- balancing the budget
- funding needs
- adequate reserves

6. Market Reaction to Change in Tuition

- what would market bear w/o decline in enrollment
- students/parents ability to pay
- impact on adult/part-time students
- follow-up market analysis of non-attending students
- market assessment
- enrollment projections
- impact of tuition on enrollment
- potential overpricing
- price elasticity
- what market will bear
- price resistance
- affordability
- impact on recruiting
- ability of student to absorb increase
- fairness
- impact on current students
- student reaction

7. New/Alternative Tuition Funding Available

- increased funding from other sources
- level of development giving
- fund raising impact/endowment impact

8. Economies of Scale
  - enrollment
  - size of student body
9. Faculty and/or Staff Pay Raise Requirement
  - faculty salary increases required
10. Physical Facilities Needs/Improvements
  - increased cost of utilities
  - physical plant needs
  - plant repair & replacement
  - deferred maintenance requests
  - energy
  - utilities/debt service
  - capital requirements
11. Levels and Availability of Student Financial Aid
  - available student financial aid
  - need for additional financial aid
  - employer reimbursement policies
  - federal & state aid programs
  - impact of federal financial aid
  - net cost to student
  - family income of student body
12. New Programs/New Equipment
  - new programs/services offered
  - needs for new computer equipment

- academic improvements
  - programmatic changes
  - new technology costs
13. Collective Bargaining Arrangements
- faculty union (collective bargaining)
14. External Environment Factors
- contract with military
  - area's general economic conditions
  - critical need to educate our publics as to private vs public, cost vs price
  - impact of new tax policy
  - exchange rate of the dollar (foreign campus operations)
  - local economy/national economy
  - campus/trustee politics
15. Quality/Cost Considerations
- cost vs perceived quality
  - quality of facilities
16. Trend in Tuition Increases
- past trends of tuition
  - rate of increase in E&G expenditures
  - decrease over time dependence on tuition
  - previous increases
  - keep tuition as low as possible
17. Cost Containment
- institutional fixed cost increases
  - cost containment



APPENDIX 4  
SUMMARY OF STATISTICAL RESULTS  
BY CATEGORY

# SUMMARY OF VARIABLES USED IN DISSERTATION DATA ANALYSIS

Pricing Strategy  
(Variable Mean Values)

CATEGORY/variables	ANOVA/ Chi-Square	Basis	Proportional	External	Peer	Residual
	Prob					
ENDOWMENT-RELATED VARIABLES						
Endowment Income as % of total E&G Revenue	0.01	%	7.6	2.4	6.7	2.8
Endowment Income per FTE student	0.02	\$	1,973	234	818	303
Endowment Per FTE Student	0.08	\$	26,046	3,381	10,694	7,368
Market Value of Endowment, June 30, 1981	0.30	M\$	33,040	11,239	33,247	17,179
Endowment Fund Balance as % of current fund exp	0.44	%	103.7	35.6	82.5	66.9
REVENUE-RELATED VARIABLES						
% Change in Tuition 72-73 through 80-81	0.07	%	190.0	152.0	147.9	140.0
Total E&G Revenues per FTE Student	0.10	\$	18,184	9,640	10,516	8,911
Private Gifts & Grants per FTE Student	0.11	\$	6,656	709	1,059	538
Tuition & Fees as % of Total E&G Revenue	0.13	%	53.5	59.2	56.2	61.2
Gifts & Grants as % of Total E&G Revenue	0.17	%	10.0	7.1	9.0	5.9
Tuition & Fees per FTE Student	0.82	\$	5,381	5,381	5,647	5,275
Table of Annual Tuition Costs	0.95	\$	6,492	6,745	6,740	6,791
ENROLLMENT-RELATED VARIABLES						
Total Headcount Enrollment	0.12	#	3,706	4,590	3,276	4,563
Total FTE Enrollment	0.15	#	2,921	3,830	2,703	3,441
FTE as % of Total Student Enrollment	0.92	%	83.0	84.4	84.3	81.8
Extent Undergraduate Enrollment Changed	0.02	N				
Impact of Tuition Increase on Enrollment	0.10	N				

# SUMMARY OF VARIABLES USED IN DISSERTATION DATA ANALYSIS

Pricing Strategy  
(Variable Mean Values)

CATEGORY/variables	ANOVA		Proportional	Pricing Strategy		
	Chi-Square	Basis		External	Peer	Residual
	Prob					
FACULTY-RELATED VARIABLES						
Tenured Nine Month Faculty	0.71	#	85.6	87.2	77.4	94.0
Weighted Average Faculty Salary-9 month	0.75	\$	21,552	21,564	23,570	22,900
Number of Nine Month Faculty	0.77	#	135.6	143.5	132.5	154.2
% of Nine Month Faculty Tenured	0.90	%	53.8	48.1	53.7	54.0
EXPENDITURE-RELATED VARIABLES						
Total E&G Expenses per FTE Student	0.10	\$	15,706	7,591	8,607	7,179
Academic Support per FTE Student	0.13	\$	1,928	539	732	607
Instructional Costs per FTE Student	0.13	\$	4,155	3,230	3,123	2,799
Instruction as of % of Total E&G Expense	0.13	%	37.4	41.8	36.4	38.1
Institutional Student Aid as % of Total E&G Exp	0.49	%	12.0	14.1	13.1	13.9
Student Aid per FTE Student	0.85	\$	661	690	727	651
Financial Aid as % of Tuition	0.90	%	13.1	13.2	14.2	12.6
EXTERNAL FACTORS						
Regional Market Share	0.09	N				
1979 Median Family Income for Each State	0.14	\$	20,189	21,528	20,512	20,247
Enrolled Students as % of Applicants	0.84	%	35.7	36.9	37.6	34.7

\$ = dollars, % = percent, # = numeric count, N = nominal (used chi-square)  
M\$ = Thousands of Dollars

IDENTIFIED GROUP DIFFERENCES  
(DUNCAN TEST,  $p < .05$ )

ENDOWMENT-RELATED VARIABLES

Endowment income as %  
E&G revenue

External	Residual	Peer	Proportional
2.4%	2.8%	6.7%	7.6%

Endowment income per FTE  
student

External	Residual	Peer	Proportional
\$234	\$303	\$818	\$1,973

Endowment per FTE student

External	Residual	Peer	Proportional
\$3,381	\$7,368	\$10,694	\$26,046

IDENTIFIED GROUP DIFFERENCES  
(DUNCAN TEST,  $p < .05$ )

REVENUE-RELATED VARIABLES

% increase in tuition 72-73  
thru 80-81

Residual	Peer	External	Proportional
140.0%	147.9%	152.0%	190.0%

E&G revenues per FTE student

Residual	External	Peer	Proportional
\$8,911	\$9,640	\$10,516	\$18,184

Private gifts & grants  
per FTE student

Residual	External	Peer	Proportional
\$538	\$709	\$1,059	\$6,656

IDENTIFIED GROUP DIFFERENCES  
(DUNCAN TEST,  $p < .05$ )

EXPENDITURE-RELATED VARIABLES

E&G expenditures per  
FTE student

Residual	External	Peer	Proportional
\$7,179	\$7,591	\$8,607	\$15,706

Instructional Cost per  
FTE student

Residual	External	Peer	Proportional
\$2,799	\$3,123	\$3,230	\$4,155

Instructional cost as %  
of E&G revenues

Peer	Proportional	Residual	External
36.4%	37.4%	38.1%	41.8%

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## BIOGRAPHICAL SKETCH

John Richard Hirté was born in Passaic, New Jersey, on October 21, 1947. After attending public schools in the United States and private schools in England, Mr. Hirté enrolled in the University of Florida earning a Bachelor of Business Administration in 1969.


Upon graduation from the University, Mr. Hirté was commissioned an officer in the United States Army. He attained the rank of Captain before being honorably discharged.

In 1972 Mr. Hirté was part of the original management staff which planned and opened the University of North Florida in Jacksonville. He held increasingly more responsible positions at this university and resigned from the administration in 1982 to pursue teaching and doctoral studies.


Mr. Hirté holds a Masters of Business Administration from the University of Florida, is a Certified Public Accountant, and a graduate of the College Business Management Institute at the University of Kentucky. He has taught finance at both the undergraduate and graduate level.

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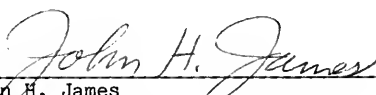
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James L. Wattenbarger, Chair  
Professor of Educational Leadership

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